MSI CRANE SCALE SAFETY MANUAL

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

Measurement Systems International

TABLE OF CONTENTS

FORWARD

This manual has been prepared to provide information and suggestions for safe operation, rigging, inspection, and maintenance of Measurement Systems International (MSI) Crane Scales.

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, a thorough study of the following information should provide a better understanding of operation and afford a greater margin of safety for personnel and machinery.

It must be recognized that 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.

Safe Operating Guidelines

Before operating a MSI crane scale, the scale operator should carefully read and study the appropriate Operation Manual supplied by MSI and note any special instructions.

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; and 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.

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.

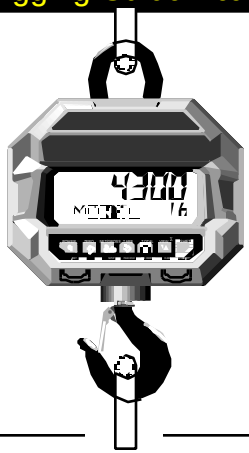
Never lift more than the crane scale's assigned Working Load Limit (WLL) rating.

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

Safe Loading and Rigging Guidelines

In-line Loading

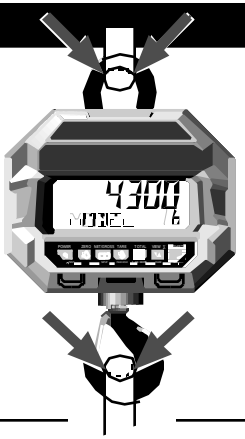
- CAPACITY RATINGS ON THE CRANE SCALE ARE FOR IN-LINE LOADING.
- USE HARDWARE THAT CREATES SINGLE POINT ATTACHMENTS AND ALLOWS THE SCALE FREEDOM OF ALIGNMENT.

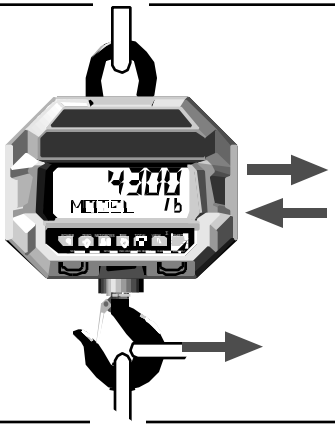


▼ During Loading Procedures ▼

DO NOT

USE INTERFACE HARDWARE THAT IS OVERSIZED. IT RESTRICTS SINGLE POINT LOADING AND SELF ALIGNMENT AND MAY RESULT IN OFF-AXIS LOADING.





DO NOT

PUSH OR PULL A LOADED SCALE AND DO NOT PULL LATERALLY ON THE HOOK WITH SCALE LOADED.

DO NOT

SIDE LOAD, BACK LOAD OR TIP LOAD A CRANE SCALE HOOK.

Incorrect

Side Load

Incorrect

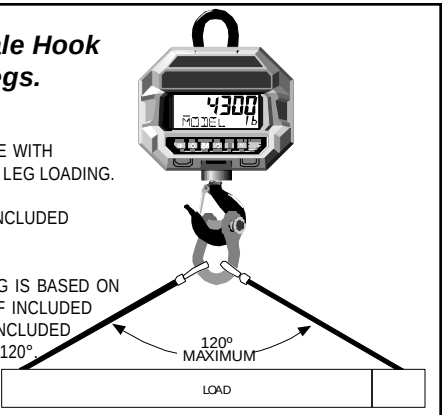
Back Load

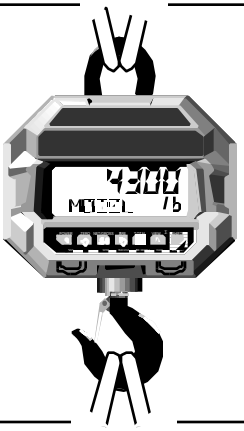
Incorrect

Tip Load

Loading the Scale Hook with two sling legs.

- USE BOTTOM SHACKLE WITH HOOK FOR TWO SLING LEG LOADING.
- NEVER EXCEED 120° INCLUDED ANGLE.
- SHACKLE LOAD RATING IS BASED ON LOAD REGARDLESS OF INCLUDED ANGLE, AS LONG AS INCLUDED ANGLE IS LESS THAN 120°.





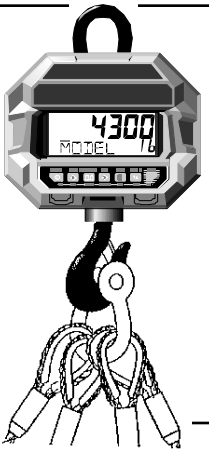
DO NOT

USE MULTIPLE ATTACHMENTS WITHOUT THE PROPER HOOK UP OF A SHACKLE.

Scale with Multiple Attachments

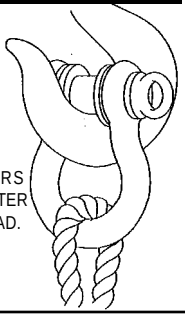
Correct

USE A SHACKLE WHEN MULTIPLE ATTACHMENTS ARE PLACED OVER A SCALE HOOK.



Add Washers to Shackle

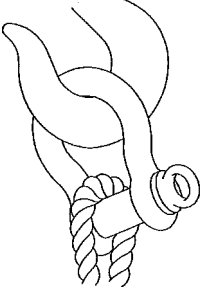
Good Practice



ADD WASHERS TO CENTER THE LOAD.

Reversed Shackle Off Center Loading

Poor Practice



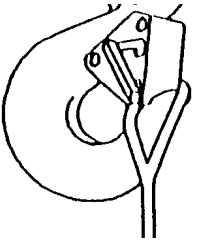
Scale Hook with Latches

Correct

ALWAYS MAKE SURE THE HOOK SUPPORTS THE LOAD.

Scale Hook with Latches

Incorrect



THE LATCH MUST NEVER SUPPORT THE LOAD.

Recommended Inspection Procedures

Causes of Damage to Hooks, Shackles, Lifting Eyes and Load Cells

▼ 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

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 MSI Distributor is strongly recommended.

Important Safety Information

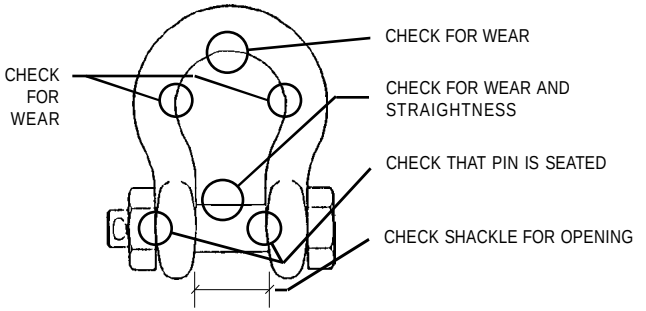
Do not use any load bearing component that is worn beyond 5% of original dimension.

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

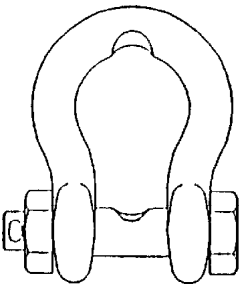
Visual Inspection of Shackles

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

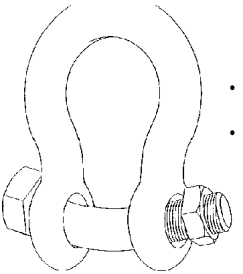
Shackle Field Inspection Areas



Shackle with Excessive Wear

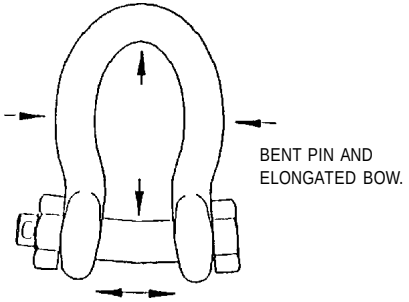


Improper Replacement of Pins in Shackle

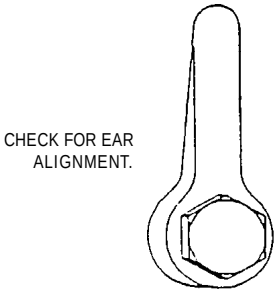


- LOOK FOR IMPROPER REPLACEMENT OF PINS.
- NEVER REPLACE A PIN WITH A BOLT OR ANY OTHER FASTENER.

Overloaded Shackle



Shackle Eye with Twist



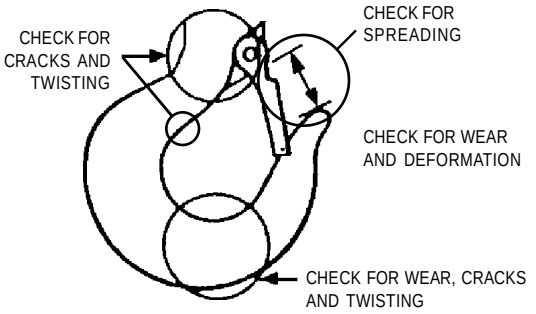
If any of the preceeding conditions exist, remove shackle from service.

Scale Hook Inspection

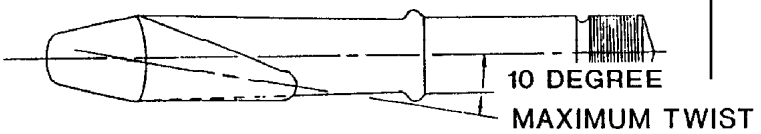
The following is a guideline to be used for the examination of scale hooks.

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

Scale Hook Inspection



Scale Hook with 10 Degree Maximum Twist



- A MAXIMUM OF A 10° TWIST IN THE SCALE HOOK POINT TO THE BODY OF THE SCALE HOOK MAY BE TOLERABLE.

Note: 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.

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

Field Inspection and Repair

- Examine crane scale hook for excessive wear. A scale hook showing a wear-reduction greater than a 5% value should be removed from service.

- Examine crane scale hook for nicks and gouges.
- Examine crane scale hook periodically by magnetic particle and/or dye penetrant test methods, or more often in severe operating conditions. Hooks found to contain cracks should be removed from service.
- Never repair, alter, rework, or reshape any load bearing component by welding, heating, burning or bending.

Recommended Preventive Maintenance

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

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.

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

Normal	——	Monthly
Heavy	——	Weekly

Designated Person Inspection
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

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 MSI Distributor 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.

Notes

Measurement Systems International
Quality Weighing & Force Measurement Equipment

14240 Interurban Avenue South
Seattle, Washington 98168-4660 U.S.A.
206 433-0199 • Fax: 206 244-8470
Web: www.msiscales.com • Email: info@msiscales.com

PUB. 243-08-94B *Printed in U.S.A.*