

Swivel Hoist Ring Installation, Use, & Inspection Instructions

Items Covered by this Document

This document covers Swivel Hoist Rings (SHR) and Forged Swivel Hoist Rings (FSHR) manufactured by and for Carr Lane Manufacturing Co. (CLM) to CLM design specifications. These items can be distinguished from others by two features:

1. An Item number, indelibly marked on the hoist ring, following this format:
 - a. CL(M)-xxxx-SHR-x-x or
 - b. CL(M)-xxxx-FSHR-x-x
2. A Hex shaped "Body," **see Appendix I for additional details.**

Installation Instructions

1. Do not use spacers between the hoist ring and the mounting surface.
2. Mounting surface must be flat and smooth for full contact under hoist ring. Tapped mounting holes must be perpendicular to the mounting surface.
3. Tighten mounting screws to the torque marked on the item. All torque values are based upon dry installation without the use of a lubricant. Periodically check torque as screws could loosen in extended service.
4. After installation, check that ring rotates and pivots freely in all directions.

Use Instructions – Operating Requirements

5. The load rating on each hoist ring is not simply total weight divided by the number of hoist rings. The resultant force can be significantly greater at shallow lift angles and with unevenly distributed loads. Determine the maximum load at any given lift angle by using this formula:

$$f = \frac{W}{N \sin A} \quad W = \text{total weight}, N = \text{the number of hoist rings}, \text{ and } A = \text{the lift angle}$$

See Appendix II for additional Details.

6. Despite the 5:1 safety factor on hoist rings, never exceed the rated load capacity. This safety margin is needed in case of misuse.
7. Tensile strength of parent material should be above 80,000 psi to achieve full load rating. For weaker material, consider through-hole mounting with a nut and washer on the other side.

8. Do not allow hoist rings to bind. Use a spreader bar, if necessary, to avoid binding. See Appendix III for additional Details.
9. Never lift with a hook or other device that could deform the lifting ring. Do not use cable assemblies for lifting. The radius of attaching hardware must be equal to or less than the inside radius of the hoist ring bail.
10. Do not reeve slings, chains, or wire, from one hoist ring to another.
11. Do not apply shock loads. Always lift gradually. If shock loading occurs, see 'Inspection after Shock-Load Incident' section below.
12. Environmental Conditions:
 - a. Allowable temperature range: -20° F to 200° F; if intended use is outside of these conditions contact CLM for further use Instructions as load ratings will be decreased.
 - b. Chemically Active Environments, other than exposure to salt or saltwater environments, require contact with CLM engineering to verify the suitability of the application.
 - c. Salt and Salt Water Environments; while SHRs are suitable for use in salt and saltwater environments, regular inspection intervals should be increased due to accelerated corrosion rates in these conditions. Additionally, materials and coatings should be considered to mitigate specific environmental conditions.
 - d. Galvanic Corrosion: When Swivel Hoist Rings are installed on dissimilar metals, galvanic corrosion may occur. The severity depends on the anodic index difference between materials and environmental conditions. Dielectric compounds or coatings may be used to mitigate galvanic corrosion, but these materials affect friction coefficients and may alter required torque values. Users must test and validate any such materials for their specific application. For applications where galvanic corrosion is a concern, contact CLM engineering to verify material compatibility.
13. If parts of the hoist ring are damaged, worn, lost, or otherwise no longer suitable for use only replacement items from CLM may be used.

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Inspection Interval

Swivel Hoist Rings (SHR & FSHRs) shall be given visual inspections on a not less than an annual basis. The higher the frequency of use, and/or the more hazardous the environment in which they are used, shall result in a more frequent visual inspection. See ASME B30.26-2015 section 26-2.8 for Inspection Intervals based upon frequent use.

If an item has been subjected to a "Shock-Load" the item must be inspected using the criteria below. In addition, it must also be Magnetic Particle inspected. If any defects are found the entire assembly must be scrapped. Do not retain components.

Procedure

1. Manually manipulate the SHR to determine if it rotates and swivels freely in all directions. If it does not, please skip to item 6 of this procedure.
2. Dis-assemble the SHR by carefully removing the retaining washer on the bolt. The retaining washer unscrews and is right-hand threaded. The washer may be made of steel or plastic depending upon the item. If damaged during removal, replacements are available for a nominal fee. Carefully segregate components. Do not mix components.
3. Visually inspect all components (See Appendix V) for areas of:
 - a. Corrosion
 - b. Excessive wear
 - c. Material that is cracked, torn, or bent
4. Visually inspect the sub-assembly.
 - a. If the assembly uses shoulder pins to retain the ring (Style 1 - SHR), the "U-Shaped" item (ring) in the sub-assembly, specifically inspect the area where the shoulder pins meet the hex body. (See Appendix VI) If present ensure that the shoulder pins are parallel to the body and equally spaced on both sides. (Angled shoulder pins, or shoulder pins unequally spaced from the body are non-conforming.)
 - b. If the assembly ring is a one-piece assembly (Style 2 - FSHR), where the "pins" that extend into the body are part of the "U-Shaped" forging (ring), ensure the ring is symmetrical in appearance and does not contain any visible deviations from dimensions or form shown in Appendix IX image.
5. Visually inspect the sub-assembly for areas of:
 - a. Corrosion
 - b. Excessive wear
 - c. Material that is cracked, torn, or bent
6. If any of the conditions above is observed in the components, please contact CLM engineering department for further instructions at engineering@carrlane.com

7. If none of these conditions is found re-assemble the SHR. **Do not mix components.**

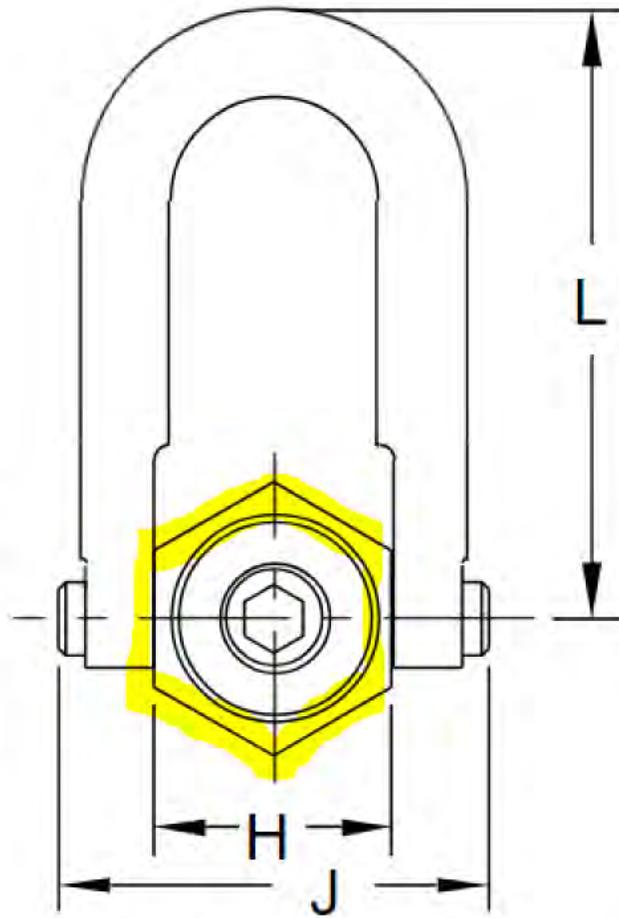
Additional Inspection for SHRs with Load Ratings of 10,000 lbs or Greater

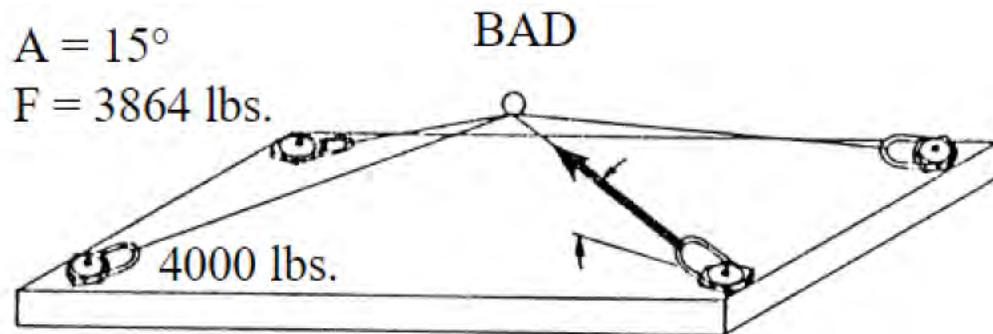
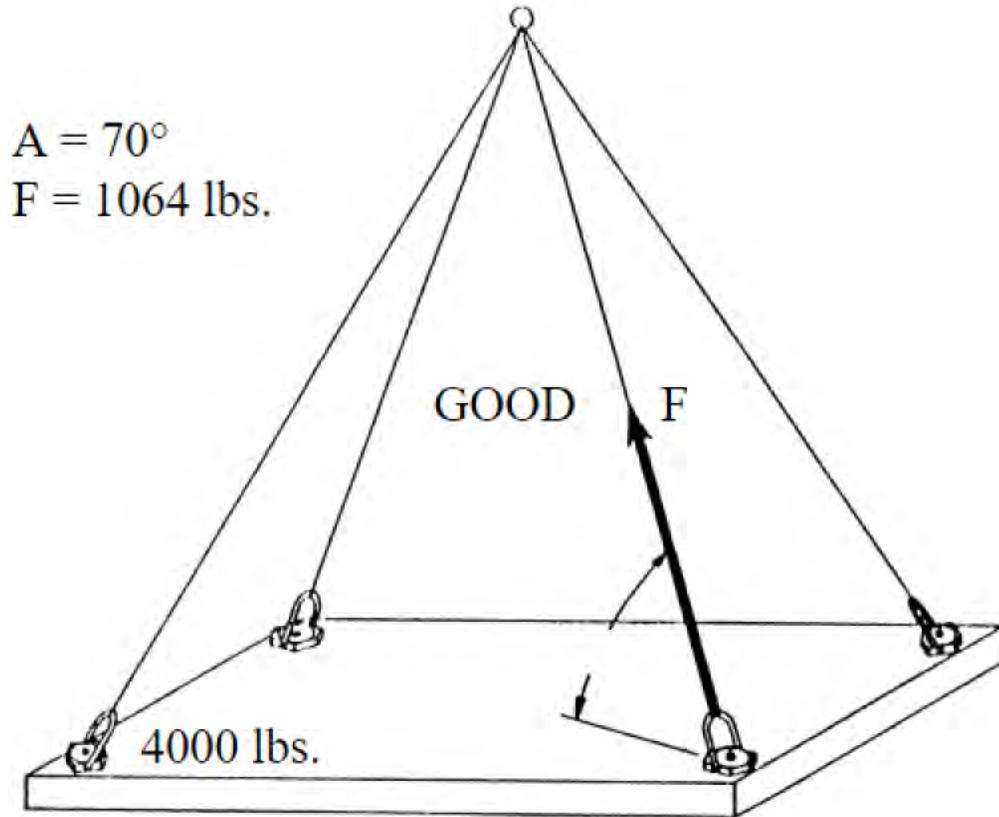
While not required it is the recommendation of CLM that all items with load ratings of 10,000lbs or greater (4,5 Metric Tons) be dis-assembled and Magnetic Particle inspected per ASTM E 1444, ASTM-A574, ASTM F788/F788M for material defects on an annual basis.

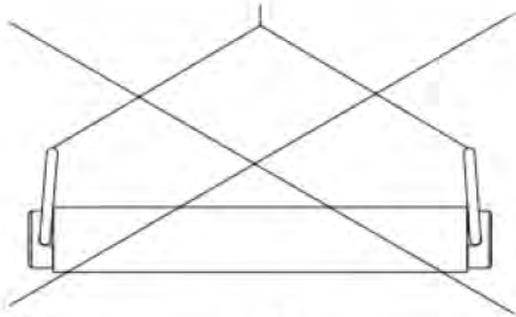
Inspection after “Shock-Load” Incident

A “Shock-Load” event occurs when significant load is applied to the item suddenly rather than gradually. This can occur when rolling over a workpiece, due to lifting hardware issues, when the item is frozen or unable to swivel and rotate freely, or from many other causes.

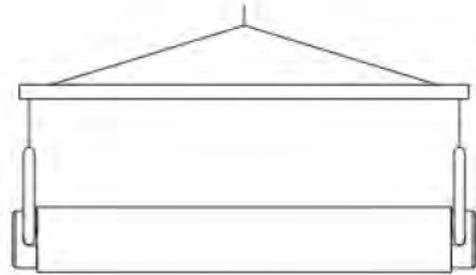








BAD



GOOD



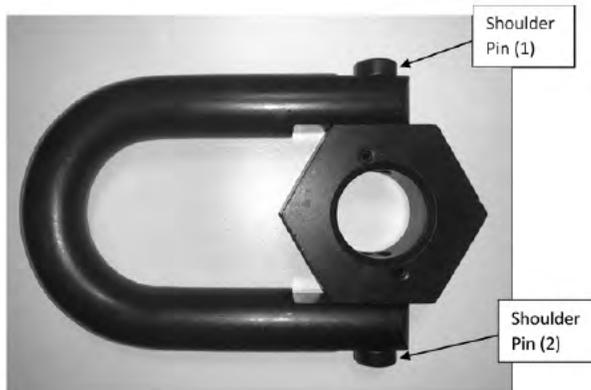
Appendix IV – Style 1 (SHR)



Appendix V – Style 1 (SHR)



Appendix VI – Style 1 (SHR)



Appendix VII – Style 2 (FSHR)



Appendix VIII – Style 2 (FSHR)



Appendix IX – Style 2

