



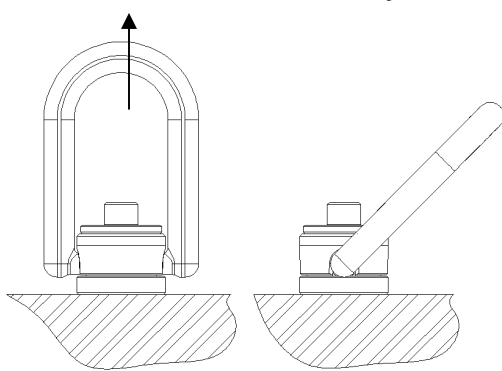
Hoist Ring SAFETY INSTRUCTIONS

CAUTION: PRIOR TO USING ANY HOIST RING, PLEASE READ THE FOLLOWING FOR PROPER INSTALLATION AND USAGE.

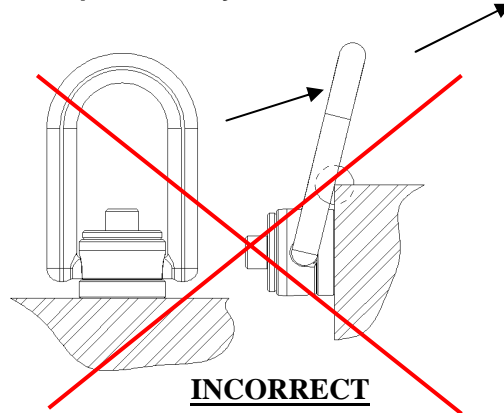
As with all mechanical devices, regular inspection for wear and strict adherence to use instruction is necessary to prevent misuse failure.

- Despite the 5:1 safety factor, NEVER EXCEED THE RATED LOAD CAPACITY. This safety margin is needed in case of misuse, which could drastically lower load capacity.
- Tighten mounting screws to recommended torque. Periodically check torque because screws could loosen with extended service.
- 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.
- AVOID SHOCK LOADING. Always lift gradually. Repeat magnetic particle inspection if shock loading ever occurs.

• After installation, always check that ring rotates and pivots freely in all directions.



CORRECT



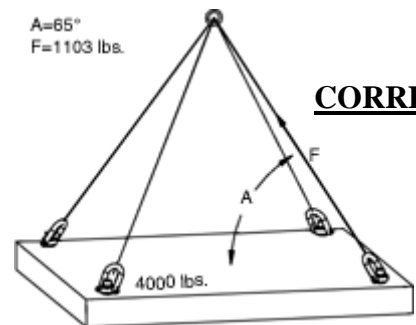
INCORRECT

IMPORTANT! The force on each hoist ring is not just the total weight divided by the number of hoist rings. The force will be greater at lower lift angles. Make sure load is evenly distributed. See below.
Formula with example data: $F = \frac{W}{N \sin A}$

F = Force on each hoist ring
W = Total weight = 4000 lbs.
N = Number of hoist rings = 4
A = Lifting angle

Safe
Fig. 1

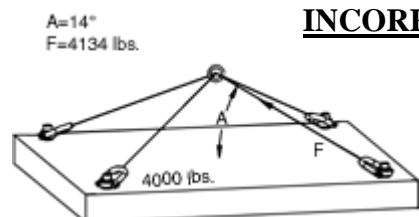
$A = 65^\circ$
 $F = 4000 / 4 \sin 65^\circ = 1103 \text{ lbs.}$



CORRECT

Unsafe
Fig. 2

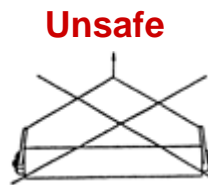
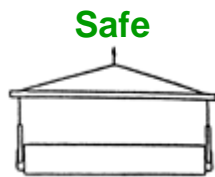
$A = 14^\circ$
 $F = 4000 / 4 \sin 14^\circ = 4134 \text{ lbs.}$



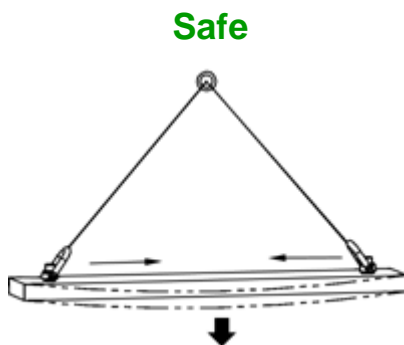
INCORRECT



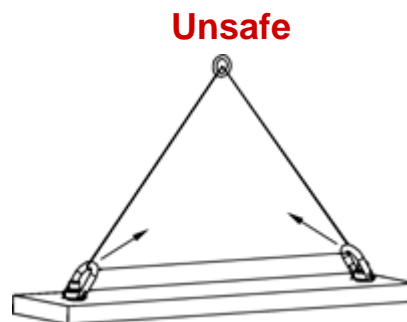
2. Never exceed the rated load capacity of the hoist ring.
3. Tensile strength of material to be lifted should be at least 80,000 PSI for full load rating. For lower tensile materials, increase thread length or use a through hole with a nut and washer on other side.
4. Do not allow hoist rings to bind. If necessary use a spreader bar to avoid binding. See example below.



5. Spacers should not be used between the hoist ring and the mounting surface.
6. Mounting surface must be flat and smooth for full contact with the safety hoist ring. Tapped mounting holes must be perpendicular to the mounting surface.
7. Mounting screws should be tightened to the recommended torque. Torque should be checked periodically as bolts could loosen in extended service.
8. Never lift with any device, such as hooks, chains or cables that could spread or damage the bail.
9. Never apply shock loads and use good lifting practices. Always lift gradually. If shock loading ever occurs, the safety lifting device should be magnetic particle inspected.
10. After installation, always check that ring rotates and pivots freely in all directions.



After slings have been properly attached to the hoist ring, apply force slowly. Make sure the bail is parallel to the direction of the load. Watch the load and be prepared to stop applying force if the load starts buckling.



Slings should not be reeved from one bail to another.

ADB EZ-Torque™ Hoist Ring

Installation Procedure

BEFORE TIGHTENING

Determine the target jackbolt torque it is located on the Nut diameter, or call ADB.

***Note:** The jackbolt torque value stamped on the tensioner is a standard value for this assembly and may not be correct for your application.*

If using air impacts: Select a tool with output of about 100% - 110% of the target torque. See "Air Impact Tool Selection" on back.

Preparation: **1)** Confirm jackbolts are lubricated with correct lubricant (JL-G). New product is pre-lubricated at the factory. **2)** Make sure the jackbolt tips are flush (or recessed) with bottom of nut body. **3)** Lubricate thread of main stud. **4)** Lubricate the washer face or jackbolt tips with correct lubricant (JL-G).

To speed up installation: use two workers at 180° apart, following the OEM pattern for tightening.

TIGHTENING SEQUENCE

STEP 1: Spin the tensioner onto the main thread until it seats against the washer. You may want to back off the tensioner slightly as mentioned in Helpful Tip #2.

STEP 2: Tighten (4) jackbolts at 90° apart (12:00, 6:00, 9:00 and 3:00) **on all studs** with a partial torque (30-70%). This serves to seat the flange. If using an impact, use a reduced setting or lightly pulse the trigger at the full setting.

STEP 3: At 100% target torque, tighten the same (4) jackbolts **on all studs**.

STEP 4: At 100% target torque, tighten all jackbolts in a circular pattern. Do this for all studs (1 round only).

STEP 5: Repeat "STEP 4" until all jackbolts are "stabilized" (less than 10° rotation). This usually requires 2-4 additional passes. If using air tools, switch to a torque wrench to stabilize at the target torque.

***Note:** Product with 4 or 6 jackbolts – use a star pattern for all steps.*

Removal Procedure

SERVICE UNDER 250° F

Preparation: Spray jackbolts with penetrating oil or hydraulic oil prior to start (especially if product is in a corrosive environment).

STEP 1: Loosen each jackbolt 1/8 turn following a circular pattern around the tensioner (1 round only). As you move around and get back to the 1st jackbolt, it will be tight again. **Do this for all studs** on the joint **prior to the next step**.

STEP 2: Repeat a 2nd round as above **for all studs**, loosening each jackbolt ¼ turn in a circular pattern.

STEP 3: Continue loosening ¼ turn for 3rd and successive rounds until all jackbolts are loose.

Note: Usually after the 3rd or 4th round, an impact can be used to completely retract the jackbolts, one by one.

STEP 4: Remove, clean, and re-lubricate the jackbolts prior to next use with correct lubricant (JL-G).

SERVICE OVER 250° F

Preparation: Above 300° F the petroleum base of the lubricant burns off. Oil per "STEP 1" below to reduce the removal torque.

STEP 1: As the equipment is cooling down (around 300° F), apply hydraulic oil to the jackbolts and washer and let sit for several hours. Thoroughly "wet-down" all components and re-apply during equipment cool down period. If the tensioner is inverted, squirt oil in the gap between the nut body and the washer. Synthetic oil can be used for oiling above 300° F.

STEP 2: Wait for tensioners to cool below 200° F. Using a circular pattern, "crack" each jackbolt only enough to ensure movement. Do not turn beyond the break loose point. Do this for all studs.

STEP 3: Now begin with "STEP 1" of the procedure for service under 250° F.

***Note:** Heating Rods can be used to reduce the removal torque required.*

ADB EZ-Torque™ Hoist Ring

Installation Procedure Continued

LUBRICANTS

Main Stud: Any standard anti-seize lubricant can be used.

Jackbolts: Are pre-lubricated from the factory with graphite (JL-G) lubricant. For reuse after high temperature service, remove clean and re-lubricate the jackbolts with the correct lubricant. For best results, also lubricate the female threads.

Washers: Apply JL-G lubricant to the washer face (or jackbolt tips). Again it is important to use the correct lubricant.

AIR IMPACT TOOL SELECTION 90 psi air pressure

Note: The jackbolt torque actually achieved by an air impact wrench is usually only 30-50% of its rated output. For minimum hand work, use an impact with an output of 110%-120% target torque. For maximum power, use the largest airline and fitting.

Up to 70 ft-lbs: For 15-35 ft-lbs use a right angle ratchet or light duty 3/8" impact. For 35-70 ft-lbs use a heavy duty 3/8" impact.

70-100 ft-lbs: Use a light duty 1/2" impact at a reduced pressure or setting. (Be careful not to over-tighten! Calibrate the impact before starting).

100-170 ft-lbs: For 100-130 ft-lbs use a light duty 1/2" impact. For 130-170 ft-lbs use a heavy duty 1/2" impact.

170-200 ft-lbs: Use a light duty 3/4" impact on low setting. Some heavy duty 1/2" impact will also reach this range.

Over 200 ft-lbs: For 200-300 ft-lbs, use a light to medium duty 3/4" impact. Over 300 ft-lbs, use a heavy duty 3/4" impact.

Calibrating an air impact wrench: Tighten one jackbolt until the socket rotation stops and check the jackbolt with a torque wrench. The torque required to move the jackbolt further is the output of the impact as measured on tensioners.

HELPFUL TIPS

PRIOR TO TIGHTENING:

- 1) Check threads of main stud: If possible, verify that the threads spin on prior to the installation date. If a thread is tight or will not thread on, try using lapping compound on the main thread and work the threads in a back and forth motion making small advances when the thread loosens up. If necessary, chase or re-tap the threads.
- 2) Back the tensioner off before tightening to provide 1/16" to 1/8" gap: The additional jackbolt extension provides easy access for oiling the jackbolt tips prior to removal. This is especially beneficial for oiling when the tensioners are inverted.
- 3) Sockets: High hex stresses require the use of quality sockets. Have several spares handy for each job and replace them at the first sign of wear. Special sockets are required when using a 3/4" impact or torque wrench due to close jackbolt spacing.
- 4) For turning the threads on and off: A spanner wrench can be utilized to grip the nut diameter. Also, two deep well sockets inserted over two jackbolt hex's at 180° apart can serve as "handles" for spinning the tensioners on and off the studs.

FOR TIGHTENING:

- 5) To improve efficiency when using impacts: Don't wait for the socket to stall completely on a specific jackbolt before advancing to the next jackbolt. It is faster, overall, to move quickly between jackbolts.

FOR REMOVAL:

- 6) 1/4 turn or less: Removing the jackbolts more than a 1/4 turn will increase the removal torque of the remaining jackbolts and you may get stuck. If this happens, you will have to retighten and start again.
- 7) Stuck Jackbolt Removal: If a jackbolt will not turn, remove, relube, and retighten a neighboring jackbolt and then try to turn it.