

STAY OUT OF HARM'S WAY

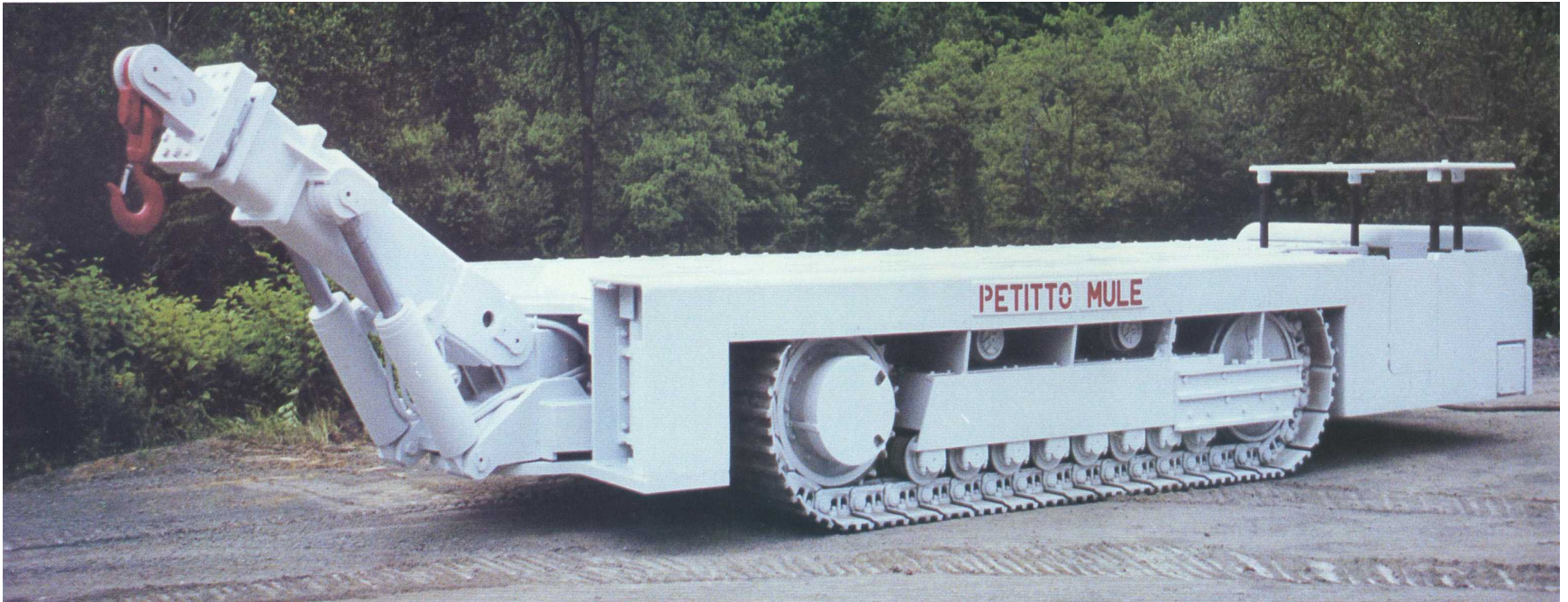


Coal Mine Safety and Health

District 3

MAINTENANCE

The process of scheduling and performing preventative maintenance activities on wire ropes and chains should be reviewed-especially in preparation for a longwall move!



F-bar with Guards



Removing Shield from Face



SLINGS

1. Chain Slings



2. Wire Rope Slings



3. Synthetic Web Slings





THE FIRST ONE I CAN FIND METHOD

SOMETIMES CHAINS ARE NEEDED TO ACCOMPLISH SOMETHING QUICKLY, LIKE TOWING A DISABLED VEHICLE OR DRAGGING SOMETHING OUT OF THE WAY. WHEN TIME IS A FACTOR, SELECTION AND INSPECTION ARE STEPS SOMETIMES EASILY OVERLOOKED.

**USE SLINGS OF
ADEQUATE SIZE
AND STRENGTH!**

TAKE INTO ACCOUNT:

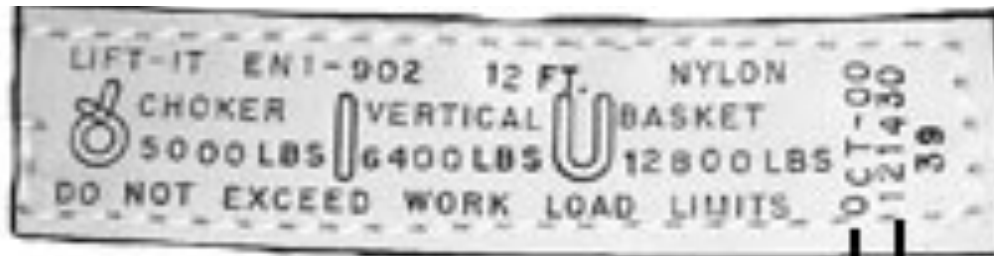
- **WEIGHT OF LOAD**
- **SHAPE OF LOAD** - avoid sharp edges (use pads)
- **HOW TO HOOK UP LOAD** - avoid dragging rigging from under the load





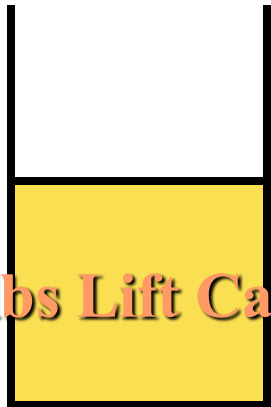
Sling Tags

- **Be familiar with manufacturer's recommendations for use and identification methods for rated load capacity and test dates.**

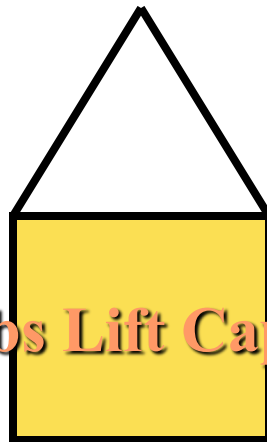


Never overload a sling!

Remember, the wider the sling legs are spread apart, the less the sling can lift!



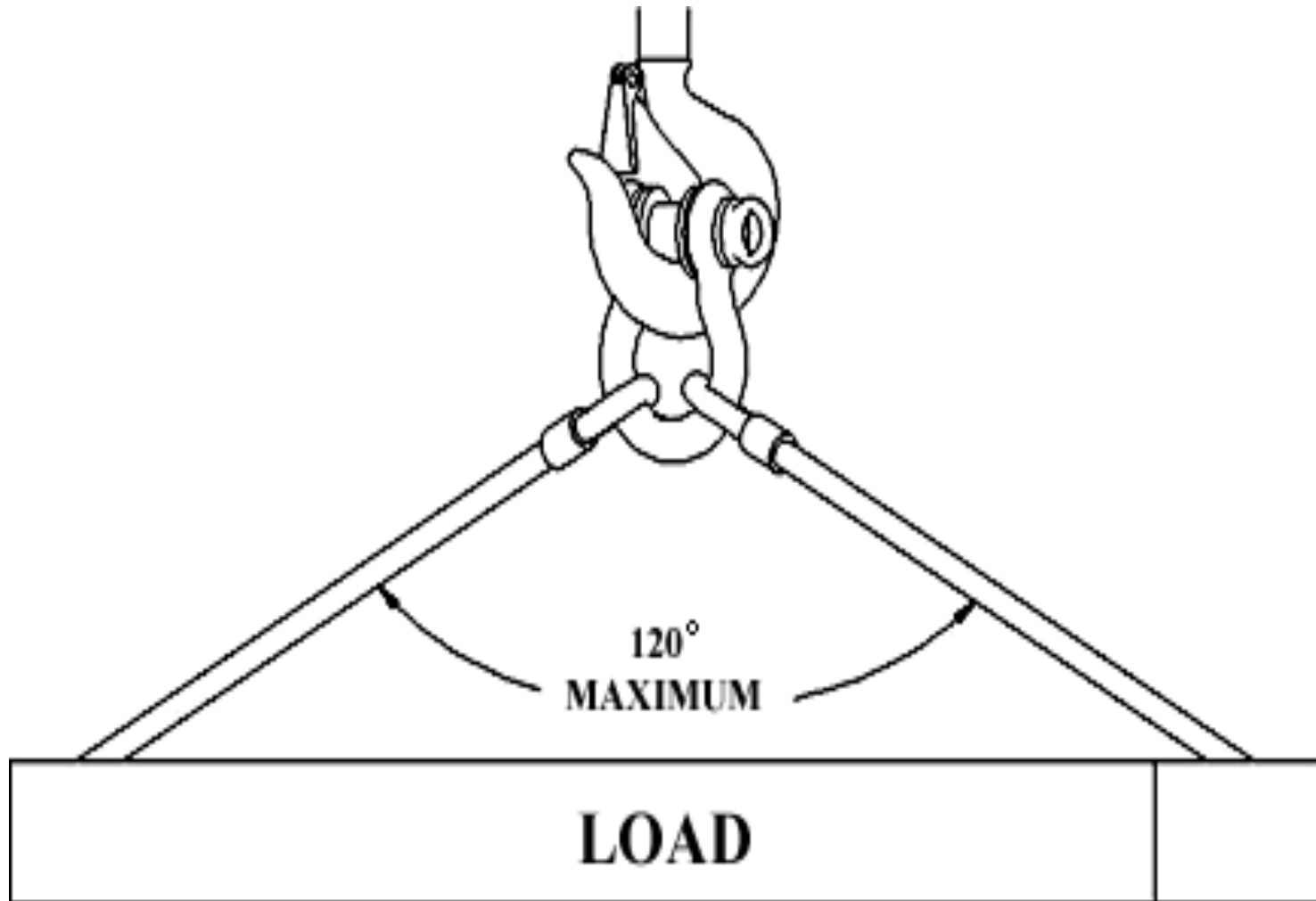
1000 lbs Lift Capacity



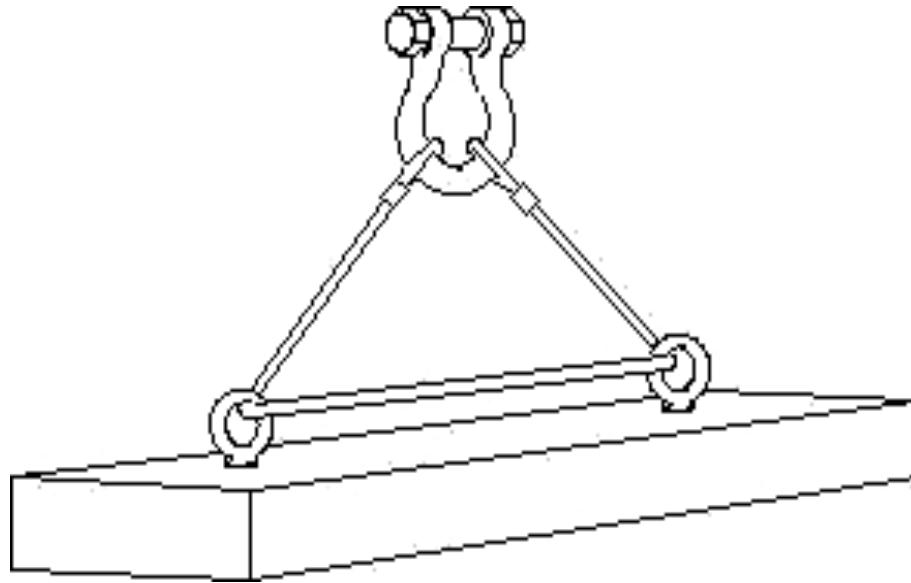
707 lbs Lift Capacity



500 lbs Lift Capacity



Reeving through connections to load increases load on connections fitting by as much as twice. DO NOT REEVE!



NEVER SHOCK LOAD A SLING!

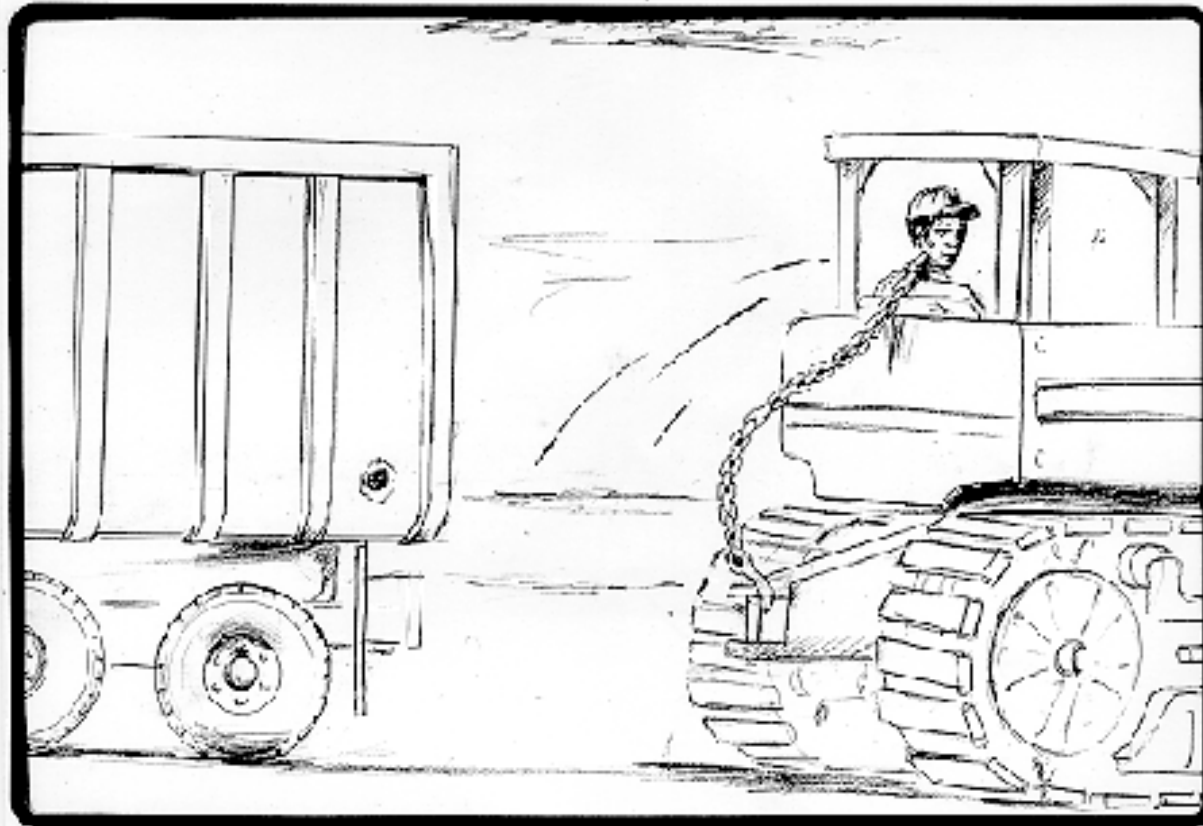


CONNECTIONS

The load capacity of the sling is determined by its weakest component.

Match size and working load limit of attachments to sling.

METAL/NONMETAL MINE FATALITY- On April 29, 1998, a 39-year old bull dozer operator with 15 years of mining experience was fatally injured while attempting to tow a truck that had become stuck. He backed the dozer to the rear of the truck and attached a chain. In the process of pulling the truck out, the chain broke and struck the dozer operator in the temple. He received severe head injuries and died several days later.



A 36-year old utility person with 4 years of mining experience was fatally injured at a surface coal mine. The victim and a co-worker were using two pick-up trucks to assist moving the power cable for an electric shovel that was being repositioned. One of the trucks lost traction in a muddy area and a nylon tow rope was attached to a hook on the truck's front end. The toe rope was then attached to a hook on the back of the second pick-up. On the first attempt to pull the truck, the metal hook broke loose from the hitch of the front truck, pierced the windshield of the rear truck and struck the victim's head.



- Known hazards tend to become routine which tends to promote complacency. This complacency may not allow us to acknowledge the hazards or identify changes that can affect our safety.
- Supervisors and miners must observe/evaluate/determine the assignment in progress.

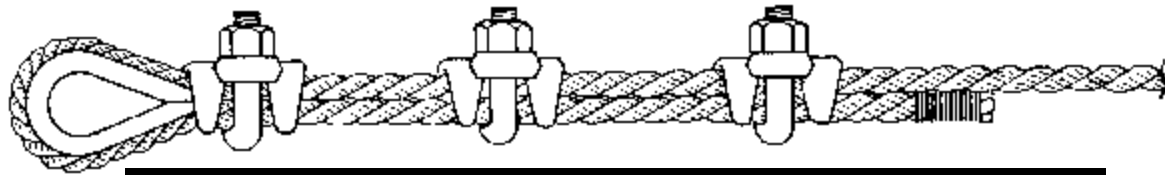


IMPROPER USE OF CHAINS

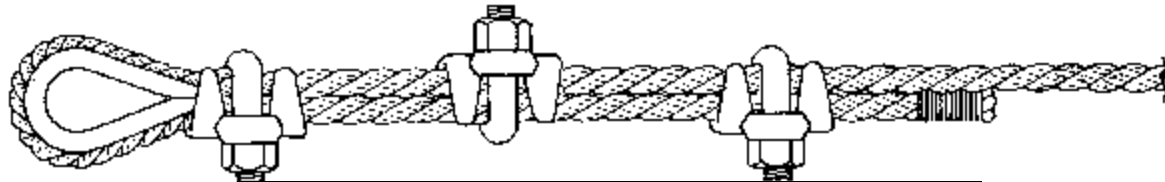
- **KNOTTED** – loading won't be along axis
- **TWISTED**
- **BOLTED TOGETHER**



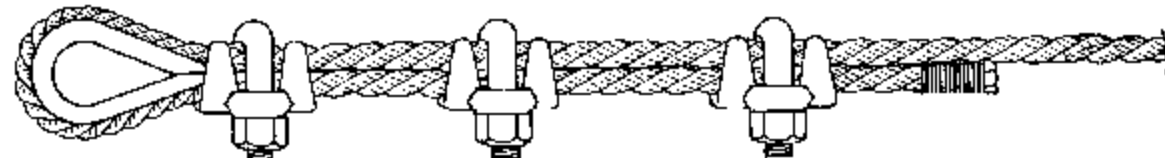
Wire Rope Clips



RIGHT WAY FOR MAXIMUM ROPE STRENGTH



WRONG WAY: CLIPS STAGGERED



WRONG WAY: CLIPS REVERSED

EXAMINATIONS

Examine sling and anchorage points prior to each use for damage and wear!

**POSSIBLY THE MOST
CRITICAL STEP IS THE
VISUAL INSPECTION OF
RIGGING EQUIPMENT!**



Chain Sling Inspection Items

- Links that are bent, stretched, cracked, or gouged.



Bent



Wear and Stretch

Wire Rope Sling Inspection Items

- Broken wires, kinking or other distortion, corrosion, and wear.



REMOVAL CRITERIA:

**MORE THAN ONE BROKEN WIRE
AT TERMINATION**



Synthetic Sling Inspection Items

- Melting, cuts, broken stitching, and stretching.



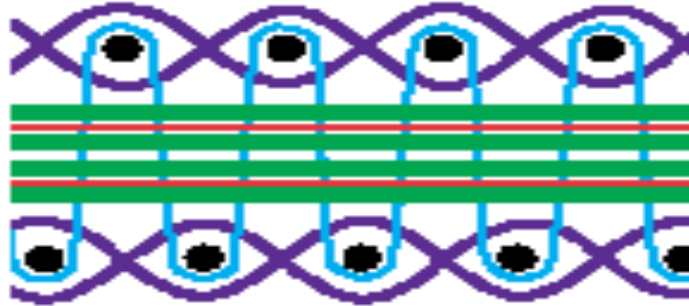
BROKEN STITCHING



MELTING AND CHARRING

One manufacturer warns: Strap is permanently damaged when exposed to temperatures in excess of 200°F. Avoid muffler and hot exhaust systems.

Sling Webbing
(Side View)



To assist operators in determining if a sling is stretched, many manufacturers incorporate a **red core warning system** inside of the sling. When this red wear cord can be readily seen upon inspecting the sling, the sling has been stretched and is to be removed



BUNCHING



PINCHING

**FOLDING, BUNCHING OR PINCHING OF
SYNTHETIC SLINGS WILL REDUCE THE RATED
LOAD**



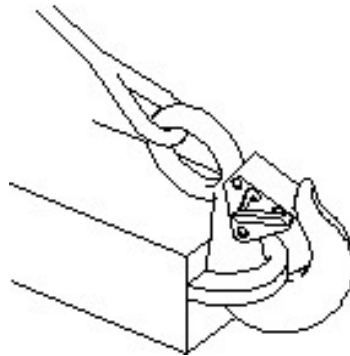
HOOKS

Never use a hook whose throat opening has been increased, or whose tip has been bent.

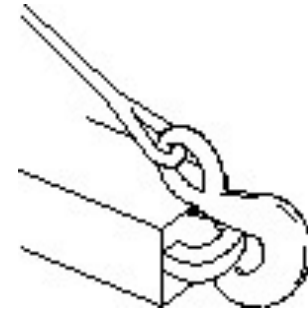
Hooks should not be side loaded, back loaded, or tip loaded.



Side Loaded



Back Loaded



Tip Loaded



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

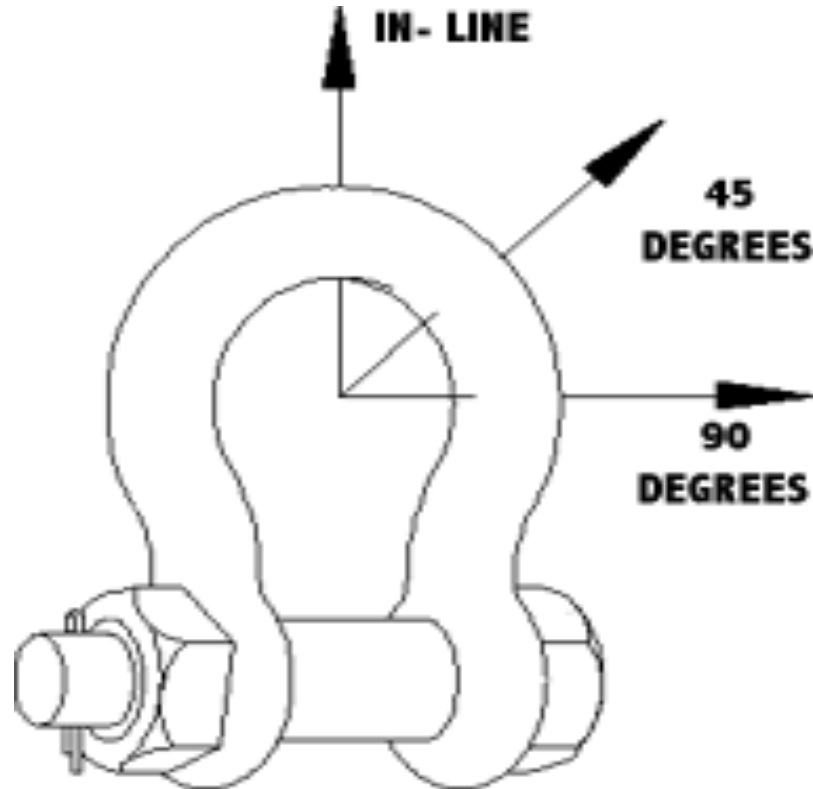
A 44-year old longwall shearer operator with 26 years of mining experience was fatally injured while attempting to advance a longwall shield. The longwall face was being mined through a setup room containing cementitious "cutable" cribs. These cribs failed, causing many of the shields to fully collapse. To advance the longwall, chains were attached from the collapsed shields to the panline. Using two adjacent shields to push the panline, the collapsed shield was pulled forward with the attached chains and the shield's double-acting ram. Miners were positioned on each of the three affected shields to manually operate them. During this process, the chain hook broke. The remaining part of the hook and the chain assembly recoiled, striking the miner operating the collapsed shield in the head.



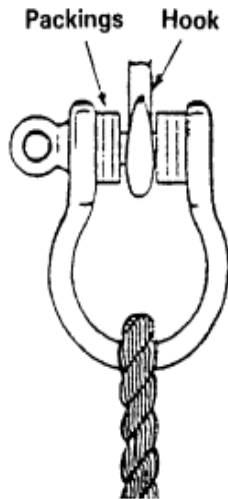
- Miners must think about how to do the task safely.
- All miners involved must be properly trained.
- Take the necessary time to find and use the correct tools.
- We must assure that miners are not unfamiliar with the task, job, or equipment. Persons take on tasks or are assigned tasks that they are not trained and/or equipped to perform.
- Supervisors and miners must communicate when there are near misses. People don't want others to know about near misses. They become embarrassed because they had erred due to inexperience, rushing, use of poor judgment, or had their thoughts elsewhere. Just because you didn't get hurt does not mean that the next person will be as lucky.

For every 300 near miss accidents, there will be 29 minor accidents. And for every 29 minor accidents, there will be one serious accident. If we encourage people to report near miss accidents, we can expect minor accidents to be reduced and possibly the serious accident will be eliminated.

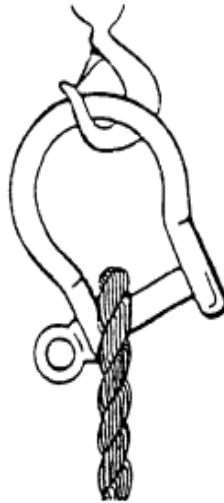
SHACKLES



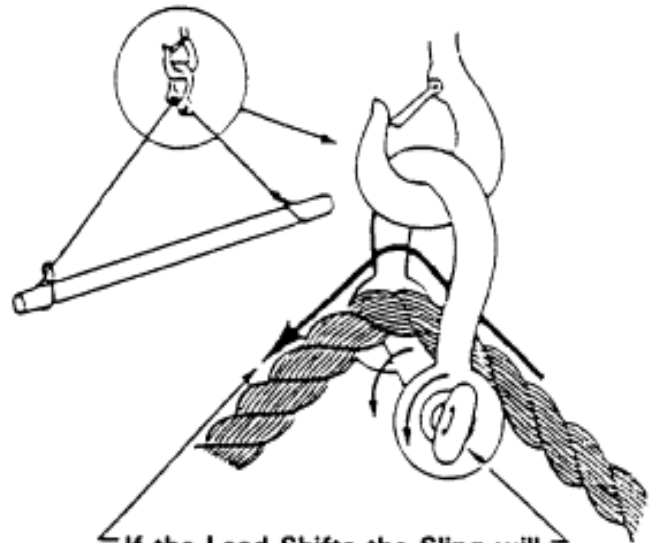
**Angle loads must be applied in the bow.
Many shackles incorporate guide markings
to check the angle of side pull.**



Good Practice
Pack the Pin
with Washers
to Centralize
the Shackle

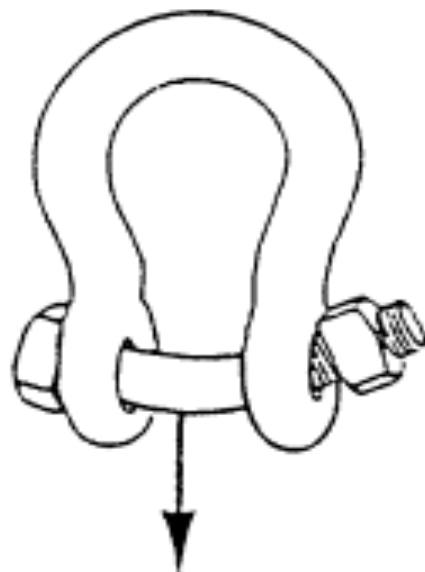


Poor Practice
Never Allow Shackle
to be Pulled at an
Angle, the Legs
will Open Up



**If the Load Shifts, the Sling will
Unscrew the Shackle Pin**

Never Replace a Shackle Pin with a Bolt



The Load will Bend the Bolt

Other Suggestions

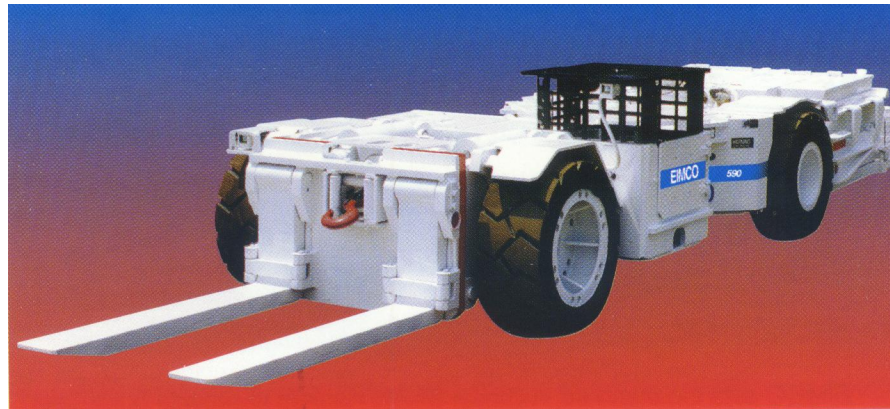


Use sheave wheels or pads to pull around corners.

Use tow bars when possible.

30 CFR § 77.1607 (u) Tow bars shall be used to tow heavy equipment and a safety chain shall be used in conjunction with each tow bar.

Equipment with winches should be equipped with guarding for the operator.



COAL MINE FATALITY - On Friday, September 3, 1999, a preparation plant mechanic and another employee were using a material hoist to lift a 55 gallon drum to the third floor of the preparation plant. When the mechanic reached out to guide the suspended drum to the third floor, a corroded railing gave way and he fell approximately 50 feet to the ground floor of the preparation plant.



30 CFR § 77.210 (c) Taglines shall be attached to hoisted materials that require steadying or guidance.

CONCLUSIONS

- **Maintain Communications!!**
- **Stay Clear!! All persons MUST be in a safe location!!**

Remember, the longer the sling, the wider the recoil radius!

QUESTIONS:

- Do you think that an individual's actions should be reviewed in accident investigations?
- Do you think that an individual's actions are a common denominator for some of our most recent accidents?
- If so, how do we fix this?
- How can we motivate people to make the correct choices?
- Any other comments or suggestions?

Any person that did not get the opportunity to field their questions, or would like to make additional comments/suggestions, please contact MSHA's District 3 office at:

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