



Shop Load Handling Safety

When working in a shop or industrial environment, it is very often necessary to lift or move a piece of equipment that weighs more than enough to hurt people. It is important to use lifting equipment properly to prevent injuries. It is easy to become complacent because this equipment is used frequently.

Jacks

Mechanical jacks use devices such as levers and screws to lift and lower loads. Screw jacks and scissor jacks (figure 1) are common additions to vehicle spare kits. They use screw threads to lift the load. Another popular jack is the high-lift or farm jack. They use a series of levers and pins for lifting. They are very useful for off road or oversize vehicles. They are notorious, however, because when lowering a load the handle can swing down quickly with force. A tight grip should be maintained on the handle, and care should be taken to stay outside the handle travel path.



Figure 1: Scissor Jack

Photo Source: <https://www.sears.com/proformance-1.5-ton-scissor-jack/p-00950101000P>

Hydraulic jacks, like the one in figure 2, allow a small force applied to one side of a pump to be translated into a large force on the other side. This force multiplication provides great lifting power in a small package. They can be found usually as rolling floor jacks or bottle jacks. Floor jacks are very common in automotive environments because of their low position and maneuverability. Bottle jacks can be found with weight ratings of one to fifty tons.



Figure 2: Hydraulic Bottle Jack

Photo Source: https://www.northerntool.com/shop/tools/product_200311813_200311813

When lifting a load with a jack, always make certain that the jack is on a firm, level surface. Any jack is susceptible to falling over, but especially farm jacks, due to their height. Stay clear of equipment, and do not lie underneath without the use of static supports such as jack stands or wood blocks. Be aware of the center of gravity of the load and block any wheels that might allow the weight to shift. Also, choose a lifting point that can support the weight of the load, such as the frame of a vehicle. Never exceed the rated capacity of the jack, as it can give a false sense of security and then fail catastrophically.

Hoisting

Chain hoists (figure 3) are a sensible addition to any workshop, and they can be found with very high weight ratings. Electric and hydraulic hoists are also available. Inspect chains, ropes, or cables for damage or wear prior to use. When overhead lifting, be sure that the hoist has a brake or load holding capability. Many electric winches do not have a mechanism to keep the load from pulling the line back out. Probably the most frequent issue with overhead lifting is not the hoist, but the supporting

structure. It is not advisable to hoist from the trusses or beams of a building unless they are designed to do so. Often hoists are mounted on homemade gantries, which is risky at best. Always ensure the hoist is mounted to a capable anchor. Lift slowly and avoid swinging the load. Do not allow anyone underneath a suspended load.



Figure 3: Manual Chain Hoist

Photo Source: <https://www.harborfreight.com/2-ton-chain-hoist-631.html>

Supporting the Load

Probably the most important aspect of lifting anything is keeping it from falling. Wood cribbing or blocks are acceptable when stacked properly on firm ground. Cinder blocks should not be used for support as they can fail unexpectedly. When lifting a vehicle, jack stands (figure 4) should be used to support the load. Never get under a vehicle with just a jack supporting it. Jacks have a smaller footprint than jack stands, leaving the vehicle susceptible to falling off. Jacks can also bleed off or malfunction, allowing the load to fall. Jack stands are built with few or no moving parts and as such are much better at holding loads long term than jacks. Keep in mind that jack stands also have weight ratings.



Figure 4: Steel Jack Stand

Photo Source: <https://www.harborfreight.com/6-ton-jack-stand-set-38847.html>

Disclaimer: Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the Southwest Center for Agricultural Health, Injury Prevention and Education. The views and opinions of authors expressed herein do not necessarily state or reflect those of the funding agency and shall not be used for advertising or product endorsement purposes.

Shop Load Handling Safety Quiz

1. True or False: A 20-ton bottle jack can safely lift 25 tons.
 - a. True
 - b. False-
2. When lifting with a jack, it is ok if the ground is
 - a. Concrete-
 - b. Mud
 - c. Sand
3. Hoists used for overhead lifting should always have a _____.
 - a. Chain
 - b. Hook
 - c. Brake system-
 - d. Laser
4. Farm jacks are dangerous because _____.
 - a. Lasers
 - b. They fall over easily
 - c. You can get hit with the lever when lowering a load
 - d. B and c-
5. True or false- when jackstands are unavailable, wood is acceptable for cribbing.
 - a. T, Only if stacked properly and on firm ground-
 - b. F
 - c. T

Shop Load Handling Safety Quiz Key

1. B, False
2. A, Concrete
3. C, Brake system
4. D, Both B and C
5. A, Only if stacked properly and on firm ground