



How to Safely Perform Pushing and Pulling Tasks

FACT SHEET 88-023-0511

A poorly designed materials-handling task is one where the strength requirements to complete the task exceed the strength capabilities of most workers. Simply put, most workers would not be able to perform the task without overexertion.

Poorly designed tasks generally require workers to lift, lower, push, pull, or carry heavy loads. These tasks may also include excessive bending, reaching, or twisting of the body.

The following guidelines provide suggestions on how to properly push and pull various objects.

To eliminate the need to push or pull, use:

- Conveyors (powered and nonpowered).
- Powered trucks.
- Lift tables.
- Slides or chutes.

To reduce the force required to push or pull:

- Improve the handhold or grip on the handle.
- Reduce the size or weight of the load.
- Use four-wheel trucks or dollies.
- Use nonpowered conveyors.
- Require that wheels or casters on hand trucks and dollies have periodic lubrication of bearings, adequate maintenance, and proper sizing (e.g., provide larger diameter wheels and casters).
- Maintain floors to eliminate holes and bumps.
- Improve the sole of the shoe to increase the shoe's grip on the floor surface.

To reduce the distance of the push or pull:

- Relocate receiving, storage, production, or shipping areas.
- Improve production process to eliminate unnecessary material handling steps.

To optimize the technique of the push or pull:

- Eliminate one-handed pushing or pulling tasks.
- Provide variable-height handles so that both short and tall persons can maintain an elbow bend of 80 to 100 degrees.
- Make sure wrists are not fully pronated (palm down) when pulling.
- Replace a pull with a push whenever possible.
- Use ramps with a slope of less than 10 percent.
- Keep the load within shoulder to mid-thigh (standing) vertical range.



Pushing heavy objects in an awkward or twisted posture can lead to back injuries.

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