POSI LOCK® PULLER, INC.

Back to the Basics
Manual Pullers

Why Pullers Are Used?

Today's technology and automation have advanced many of the tools that technicians use for working on motorized components. Almost everything is driven by a motor of some sort, or it was made by a machine that was driven by a motor. This opens up the need for a practical tool to be used for maintenance and repairs; the gear and bearing puller.

Gear and bearing pullers are simple tools that are designed for hundreds of applications. They are used to remove gears, bearings, sprockets, pulleys and other press fit items from shafts. As the name suggests, pullers pull gears and bearings from engines and equipment of all types. Pullers also allow users to gain access to tight spots.

The most important purpose of a manual puller is to remove objects without causing damage to other parts of the equipment during the maintenance process.

> *Remove cam and crankshaft gears simultaneously not disrupting the engine timing.*
> *Remove ball bearings from manual transmissions.*

Gear and bearing pullers can be used to remove objects that require more of a steady pull than using bare hands or to retrieve objects that have fallen into crevices that are too small to access. The multiple applications of pullers make them an **indispensable** part of any tool box.

Gear and bearing pullers come in a range of sizes, shapes and designs.

**Posi Lock Puller Inc. is the only manufacturer that has a patented Safety Cage® design.*

What are the components?

Manual gear and bearing pullers generally consist of three main parts:

- Jaws *(2-or3-jaw options)*
- Cross Arm/ Cross Bar
- Center Bolt

Posi Lock Puller manual gear and bearing pullers have a patented design, that consist of:

- Patented Safety Cage®
- T-handle
- Jaw head assembly *(simular to the cross arm)*
- Jaws *(2-or3-jaw options)*
- Center Bolt

Technicians typically use a 2-or 3- jaw puller. 2-jaw pullers are popular for jobs that require removal of gears from very tight spaces. 3-jaw pullers are commonly used for a more even pull if space permits.

The 2- jaw puller is noted for effectively handling small gears that require immense force to remove. The 3-jaw puller is even better at applying force because the extra jaw helps evenly distribute the force.

How do pullers work?

Although there are many applications, the process for proper gear and bearing removal is the same:

Select the proper puller
The technician examines the part to be pulled and selects the proper size puller for the application.

Adjust and fit the puller
The jaws and T-handle of the puller need to be adjusted so that it fits tightly around the part to be removed.

Position the center bolt
The technician turns the center bolt down to touch the shaft, taking careful consideration to adjust the jaws and T-handle until the point of the center bolt is in the center of the shaft.

Turn the center bolt
The technician then turns the center bolt slowly and carefully applying force onto the shaft.

Remove the part
The process continues with turning of the center bolt and results in pulling the part off the shaft.

Selecting a manual puller

When choosing the proper puller for a specific application, several points must be considered:

Puller Reach
Puller reach is the available *distance between the pulling surface of the jaw and the jaw head of the puller.* This distance varies and decreases as jaws are opened. When choosing a puller, make certain the reach is sufficient to attach the puller.

Puller Spread
Puller spread is *twice the distance from the center bolt to the pulling surface of the jaw.* In choosing the proper puller make certain the puller has a large enough spread to attach to the object being removed.

Tonnage
Tonnage is the *amount of pulling force that can be safely exerted by the puller*. Tonnage may be estimated by looking at the torque curves. **One rule of thumb in choosing a puller is the center bolt diameter must be at least ½ the diameter of the shaft from which the object is being removed.** It is impossible to predict the exact force needed for every pulling situation. The amount of press fit and force of removal can vary greatly between jobs. The setup requirements along with the size, shape, and condition of the parts being pulled are variables which must be considered.

Safety | OPERATOR SAFETY COMES FIRST!
Study each pulling application before you select a puller. A significant amount of force can be exerted with a puller. Respect theses forces and always observe safety precautions:

a. Always select the proper puller for each pulling job. A puller equal to or larger than required.
b. Inspect the puller before each use. Replace any worn or damaged parts with authorized parts.
c. Always wear safety goggles when using pullers.
d. Always use hand tools with mechanical pullers.
e. Never apply heat or alter the puller by welding, cutting, or grinding.
f. Support the puller and object being pulled.

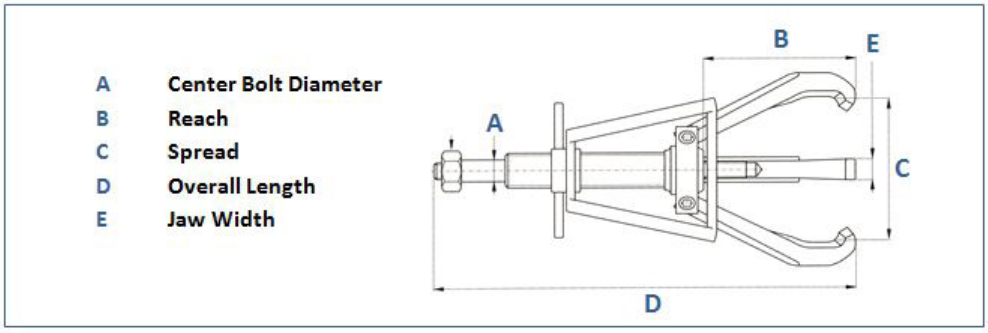


**Diagram showing the breakdown of a Posi Lock puller.*

Target Markets

Pullers are used wherever machinery poses tough maintenance challenges throughout various markets:

- Manufacturing
- Oil fields
- Wind farms
- Paper mills
- Construction sites
- Logging
- Railroad
- City/County/State dept.
- Automotive shops
- Salvage yards
- Steel mills
- Mines
- HVAC
- Hospitals
- Hotels & Restaurants
- Casinos
- Recycling centers
- Processing plants
- Dry cleaners
- Vending
- Aviation
- Shipyards
- Power plants
- Printing presses

Applications

Small repair jobs can be ***frustrating*** without the proper tools and big maintenance jobs can be ***time consuming***. Manual pullers can help simplify repairs on anything from sewing machines to alternators - washing machines to tractors. **THE LIST GOES ON:**

- Boat Motors
- Small Engines
- Starters
- Conveyor Belts
- Golf Carts
- Lawn Mowers
- Timing Gears
- Snowmobiles
- Motorcycles
- Battery Terminal Removal
- Air Compressors
- Washing Machines
- Windshield Wipers
- Power Steering Pumps
- Harmonic Balancers
- Fly Wheels
- Steering Links
- Transmissions
- Snowmobiles
- U-joint Removal
- Timing Sprockets
- Drive Gears
- Fire Hydrants
- Armature Bearings
- Cotton Gins
- Helicopters
- Restaurant Equipment
- Swathers
- Balers
- Mowers
- Tractors
- Fertilizer Equipment
- Side Carrier Bearings
- Transit Buses
- Fleet Vehicles
- Construction
- Turf Equipment
- Dairy Farms
- Cornhead stock rolls
- Pillow Bearings
- Crushers (cars)
- Fork Lifts
- Ag Equipment
- Ice Machines
- Convection Ovens
- Chillers
- Condensers
- Exhaust/Ventilating Fans

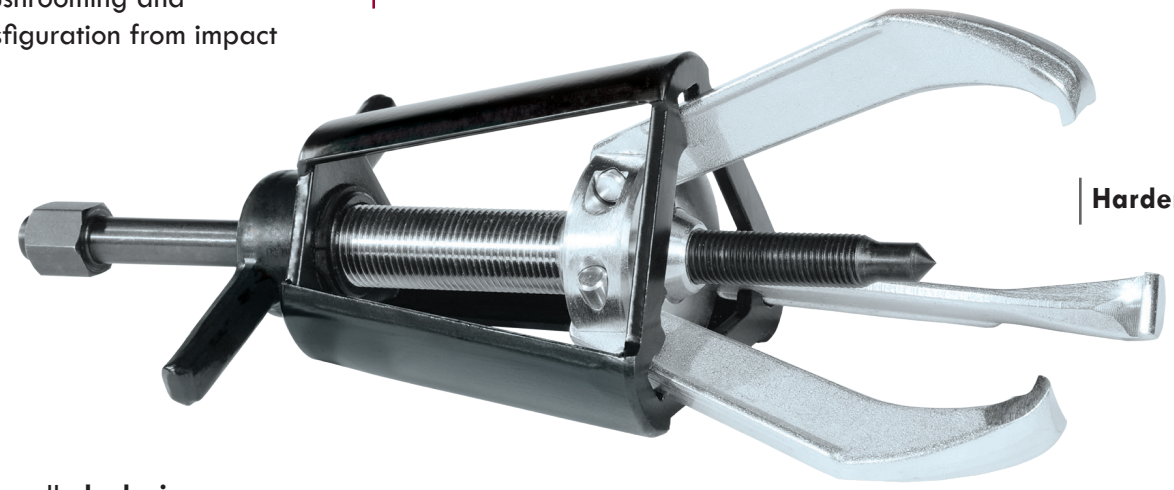
POSI LOCK® PULLER, INC.

Why Posi Lock?

Nut recessed to avoid mushrooming and disfiguration from impact

Cage guides jaws for **fast setup, solid contact** and **superior safety**

Center bolt threads designed for **less effort** to apply **high torque**



Hardened tip

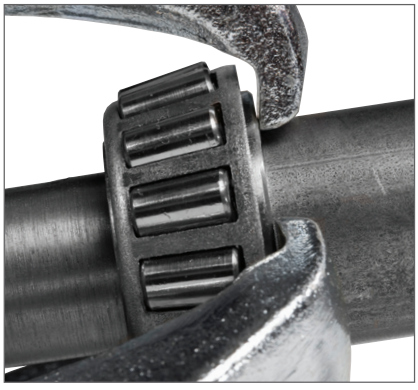
T-handle **locks jaws** precisely where you set them

Leverage up front for **vise-like power** and **no slippage**

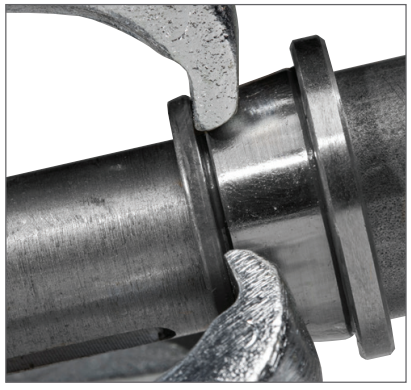
Slim tapered jaws allow for **easier gripping** and **better access** to tight spots

Posi Lock's manual gear and bearing pullers set the standard for quickness, ease and convenience. Posi Lock offers a complete line of 2 and 3 jaw pullers ranging from 1 to 40 ton capacity, along with accessory items and specialty pullers.

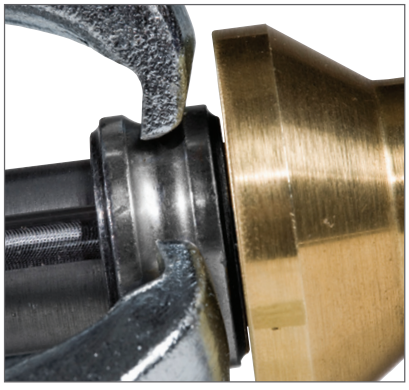
With Posi Lock, pulling bearings is strictly a one-man operation. The T-handle and Safety Cage ® control the jaws at all times. This means that the opening, closing, locking and aligning of the jaws is all done automatically by simply turning the T-handle.



Tapered jaw design allows clamping around bearing for a perfect pull



Tapered roller bearing on shaft



Lock on ball grooves and bearing races