



PULLERS

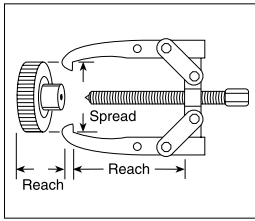
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YOU CAN SOLVE THE 3 BASIC PULLING PROBLEMS...

The first thing you have to do is identify exactly what your particular pulling problem is. Once you recognize the problem, you can go on to select the right tool to solve it.

HOW TO SELECT THE RIGHT PULLER

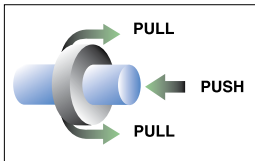
- 1: Determine the type of puller or puller combination. Which puller type is best for "getting a grip" on the part? Is a combination of puller types required?
- 2: Determine the "REACH" needed. The puller you select must have a "reach" equal to or larger than the corresponding sizes of the part.
- 3: Determine the "SPREAD" needed. The width of the part to be pulled will determine the "spread" required.
- 4: Estimate the force required. A puller with the correct "reach" and "spread" will usually have enough power. When in doubt, always use the next larger size. More power may be needed for rusted parts, or when the "area of resistance" is large.



GENERAL RULE OF THUMB:

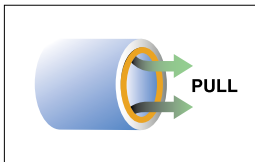
Manual pullers require that the puller screw be at least half as large (in diameter) as the shaft of the pulling job.

Hydraulic pullers need the maximum force exerted in tons to be 7–10 times the diameter of the shaft in inches.



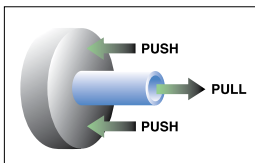
1 PULLING SOMETHING OFF A SHAFT.

Removing a gear, bearing, wheel, pulley, etc., to replace it or get at another part.



2 PULLING SOMETHING OUT OF A HOLE.

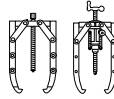
Internal bearing cups, retainers, or oil seals are usually press-fitted and are difficult to remove.



3 PULLING A SHAFT OUT OF SOMETHING.

A transmission shaft or pinion shaft is often hard to remove from a bore or housing. Use a Push-Puller with adapters if you can "get a hold of" the threaded end of the shaft. Sometimes it's possible to push a shaft through a housing, rather than pull it out. In applications of this type, the puller legs must be securely fastened to the housing and the screw may simply bear against the shaft.

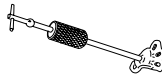
The tools to use when pulling something off a shaft:



Jaw-type puller, either manual or hydraulic. (For extra force and convenience use a hydraulic puller.) Both are available in 2- or 3-jaw versions and are used to grip the outer circumference of an attachment.



Bearing pulling attachment. Provides "knife-like" edges to get behind the component, or when there isn't a good gripping area on the part to be pulled. The splitter gets behind the component to prevent damage to the part.



Push-Puller® with attachments. External-internal adapters can thread directly into tapped holes on a component.



Slide hammer puller with selected attachments for multiple light-duty pulling tasks.

A variety of OTC adapters can be used to protect a shaft, bridge a hole, thread into tapped holes, or assist installation.

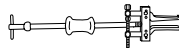
The tools to use when pulling something out of a hole:



Internal pulling attachments have narrow jaws which extend through the center of the part to be pulled. They provide a straight pull and avoid damage to housings. Designed for use with Push-Pullers or slide hammer pullers.



Push-Puller in combination with internal pulling attachment. Both mechanical and hydraulically powered versions are available.



Here a slide hammer puller is combined with an internal pulling attachment. Ideal for removing parts from blind holes, especially when there is no housing to brace puller legs against.



When there is a shaft to bear against, a forcing screw of the correct size may be used in combination with an internal pulling attachment.

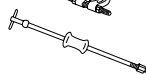
The tools to use when pulling a shaft out of something:



Push-Puller® with threaded adapter. Use a mechanical or hydraulic puller, depending on the size of the shaft to be pulled.



When the housing lacks sufficient surface for the puller legs to bear against, a pulling attachment may be used to provide support.



Slide hammer puller with threaded adapter – either external-internal or internal can be used.



Internal adapters are fastened to the external threaded end of the shaft to pull while pushing against the housing.

External-internal adapters are threaded into the shaft to pull it while pushing against the housing.

SAFETY PRECAUTIONS

⚠ WARNING: TO PREVENT PERSONAL INJURY WHEN USING PULLERS,

- Wear approved eye protection, such as safety glasses, goggles, or a face shield.
- Inspect puller for dents, cracks, or excessive wear before use. Inspect forcing screw for signs of galling or seizing. Replace worn or damaged components.
- Do not exceed puller's rated capacity, spread, or reach. Use correct size of puller for application.
- Ensure puller is correctly aligned with application and seated on component to be removed. Jaws must be parallel to forcing screw.
- Do not use wrench extensions when applying a load.
- Cover application with a shield or protective blanket before force is applied to contain flying debris should breakage occur.
- Apply force gradually. Do not use an impact wrench to apply force unless instructions specify use with an impact wrench.
- Do not strike or "sledge" puller or component.
- Do not modify puller by grinding, heating, or other means that could weaken puller strength.



ABOUT MECHANICAL PULLERS

A pulling system can exert tons of force and it is difficult to predict the exact force required for a pulling application. It is important to observe safety precautions when using a puller.

The OTC pulling system is versatile. For that reason, it is possible that various components in a pulling setup will have different tonnage ratings. The lowest capacity component determines the capacity of the entire setup. For example, when an accessory having a capacity of one ton is used with a 10-ton capacity puller, the puller setup can be used at a force of only one ton.

If you are unsure which puller or attachment to select for an application, contact your OTC tool representative or Service Solutions, LLC.

PULLER OPERATION

1. Mount the puller so its grip is tight. When using a jaw-type puller, tighten the adjusting strap bolts. For a better grip and more even pulling power, use a 3-jaw puller when possible.
2. Align puller legs and jaws. Verify the setup is rigid and the puller is square with the application.
3. Use the correct size of puller for the application. If you have applied maximum force and the component has not moved, switch to a larger capacity puller.

4. Apply force gradually. The component should give a little at a time. Do not try to speed up the application by using an impact wrench on the forcing screw.
5. Do not couple puller legs. The tonnage capacity of the puller is reduced when longer-than-standard legs are used or when legs are compressed, increasing the chance of breakage.
6. Keep reach to a minimum. Use the shortest legs possible to reach the component to be removed.
7. Install threaded puller legs evenly into the component, attachment, or adapter. Uneven legs result in greater force applied to one side of the puller, which can result in breakage.
8. Sliding plates must be on the opposite side of the cross block from the forcing screw nut or hydraulic cylinder.
9. Bearing pulling attachments may not withstand the full tonnage of the pullers with which they are used. The shape and condition of the component being pulled affects the tonnage at which puller blocks and / or studs may bend or break. Select the largest attachments that fit the component being pulled.

PULLER MAINTENANCE

Keep the puller clean, and frequently lubricate the forcing screw from threads to tip.

Protective Blankets

Think of them as "security blankets." They wrap around pulling, pressing, and other high-force jobs to protect you and your employees from work-related injuries as much as possible. They're made of high tensile, tear resistant ballistic nylon – similar to military flak jackets – that, when tested, withstood the shattering of a neck-down grade 8 bolt without any visible damage.

NOTE: Always reduce the force from the work piece prior to removing the blanket. Protective blankets may afford protection from injuries to users and others should part breakage occur. Because of the variety of situations that require guarding, it is the user's responsibility to determine the best method of protection.

- 1230PB**
Protective blanket. 12" x 30"
- 2036PB**
Protective blanket. 20" x 36"
- 2860PB**
Protective blanket. 28" x 60"



1230PB



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