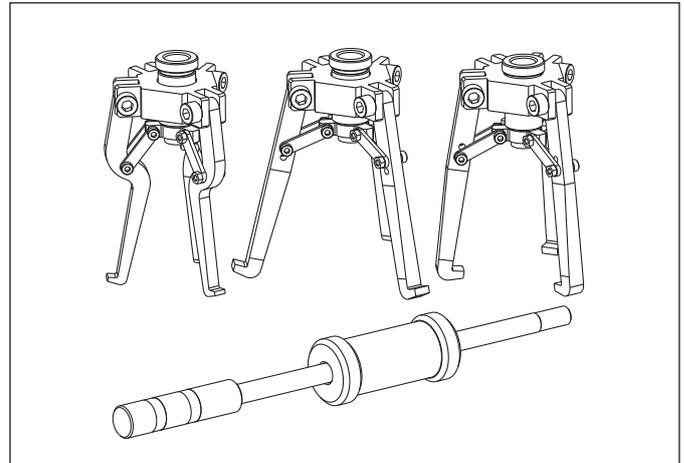


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1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

2.0 SAFETY

2.1 Introduction

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and/or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance or incorrect operation. Do not remove warning labels, tags, or decals. In the event any questions or concerns arise, contact Enerpac or your local Enerpac distributor for clarification.

If you have never been trained on high force tool safety, consult your distributor or service center for information about an Enerpac safety course.

This manual follows a system of safety alert symbols, signal words and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious personal injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING, CAUTION and NOTICE.



WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.



CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.



NOTICE Indicates information considered important, but not hazard related (e.g. messages relating to property damage). Please note that the Safety Alert Symbol will not be used with this signal word.

2.2 Safety Precautions - Mechanical Pullers



Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the puller or preparing it for use.
- Wear appropriate personal protective equipment (PPE) such as safety glasses and face shield. The operator must take precautions against injury due to flying debris caused by possible failure of the tool or workpiece.
- During operation, keep hands and fingers away from the work area to avoid personal injury.
- Do not use the puller in circumstances where a sudden release of mechanical force could result in loss of balance, causing damage or injury.
- Never attempt to pry the puller by inserting tools or other objects between the jaws. This may cause damage.
- 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. Set-up requirements along with the size, shape and condition of the parts being pulled are variables which must be considered. Study each pulling application before you select your puller.

- Do not overload equipment. Use the correct size puller for your application. If you have applied significant force, and the part still will not move, then use a larger capacity puller. Use of sledge hammers to assist in removing components is not recommended.
- Do not overtighten the spindle. Stop tightening if the spindle bends, or if deformation of the jaws occurs.
- Do not use the puller if threads on the spindle and/or body are damaged or worn. Do not use the puller if the spindle is bent.
- Apply force gradually. Align puller jaws as required. Be sure the setup is rigid and that puller is square with the work.
- Make sure that all puller components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges and corrosive chemicals.
- Always perform a visual inspection of the puller before placing it into operation. If any problems are found, do not use the puller. Have the equipment repaired and tested before it is returned to service.
- Never use a puller that is damaged, altered or in need of repair.
- Always be sure that the spindle is loosened before performing any puller adjustment or repair procedures. Never service the puller while it is installed and under tension.
- Always read, understand and follow all safety precautions and instructions, including those that are contained within the procedures of this manual.

CAUTION

Failure to observe and comply with the following precaution could result in minor or moderate personal injury. Property damage could also occur.

- Immediately replace worn or damaged parts with genuine Enerpac parts. Enerpac parts are designed to fit properly and to withstand high loads. Non-Enerpac parts may break or cause the product to malfunction.

NOTICE

- High force tool equipment must only be serviced by a qualified technician. For repair service, contact the Enerpac Authorized Service Center in your area.

3.0 PRODUCT DESCRIPTION

The IPM3 is a mechanical internal puller. It is configurable using either 2 or 3 jaws to suit a variety of different pulling applications. An integral slide impact hammer is used to exert pulling force.

The puller is supplied with 2 types of jaws, allowing it to be adapted to wide range of internal diameters. In addition, the puller's standard set of jaws can be reversed in order to configure the tool as an external puller.

4.0 FEATURES AND MAJOR COMPONENTS

Figure 1 shows the assembly of the puller with the internal jaws installed. This configuration is optimal for small diameters.

The standard jaws can be assembled in the internal configuration for larger internal diameters or in the external configuration for external pulling applications.

5.0 SETTING UP

5.1 Configuration

The diameter of the workpiece will determine which jaws must be selected.

Select the internal jaws for diameters from 0.98 to 2.36 in. [25 to 60 mm.]

For diameters from 2.36 to 3.94 in. [60 to 100 mm.] install the standard jaws in the body of the puller.

For external diameters from 0.59 to 2.95 in. [15 to 75 mm.] install the standard jaws in the external configuration.

The following tools are needed in order to remove the jaws from the body:

- M6 bolts: 5 mm Allen Key.
- M3 bolts: 2.5 mm Allen key + spanner number 6.

When installing the standard jaws, the user will find two positions for the M3 bolts.

- Use the upper hole in order to install the jaw in the internal configuration. Refer to Figure 2.
- Use the lower hole in order to install the jaw in the external configuration. Refer to Figure 3.

For applications where a circular grip is not advisable, the IPM3 can be assembled in a 2 jaw configuration using either set of jaws. Refer to Figure 4.

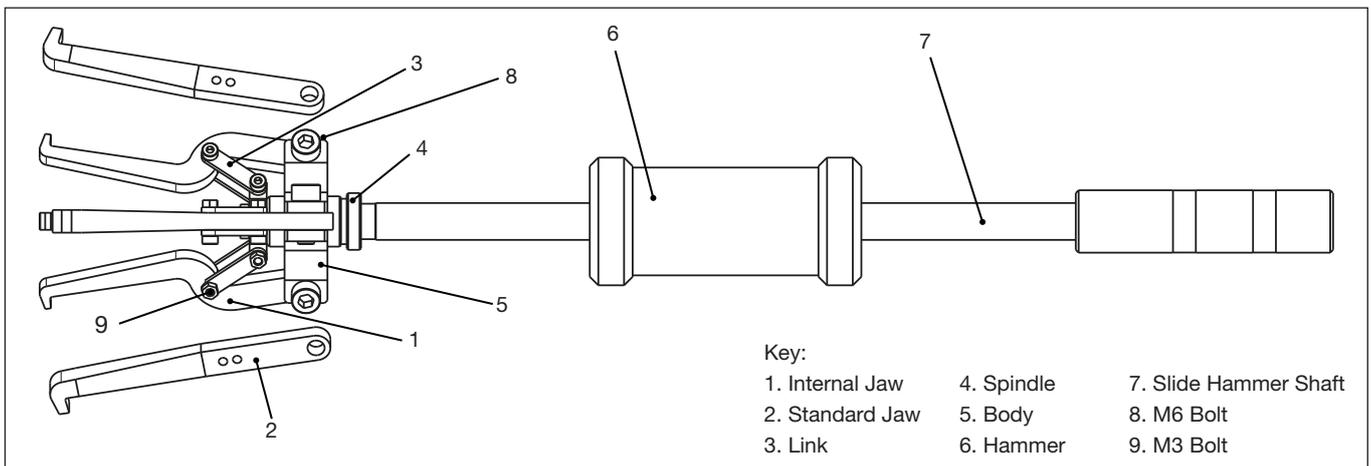


Figure 1: Features and Major Components of the IPM3

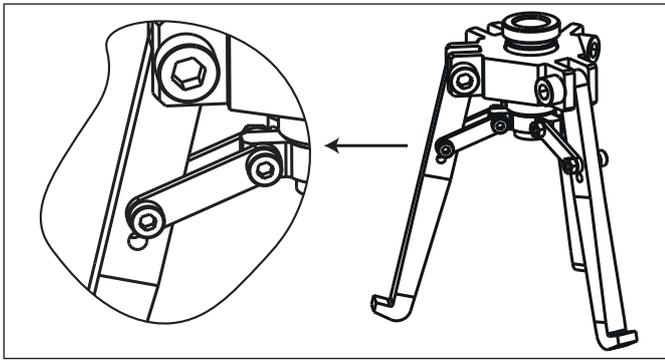


Figure 2: Installation Detail for the Standard Jaw, Internal Configuration

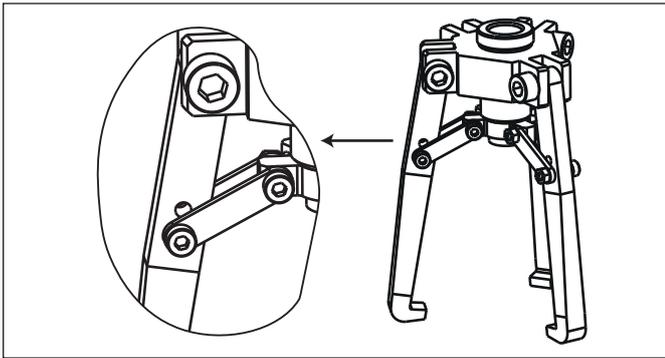


Figure 3: Installation Detail for the Standard Jaw, External Configuration

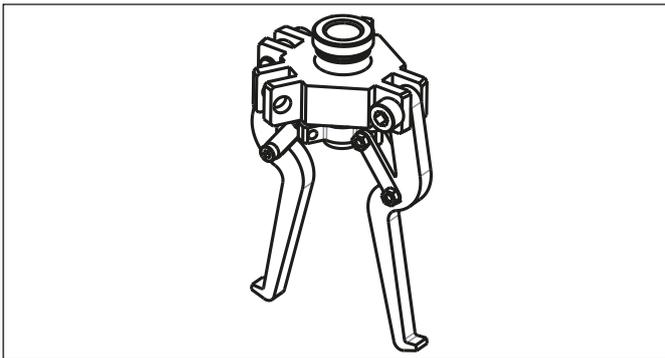


Figure 4: Internal Jaw with Two Jaw Configuration

6.0 OPERATION

6.1 General Puller Use Instructions

- Be sure that the puller spindle is cleaned and greased before use.
- Be sure that the jaws are properly centered on the item to be removed.
- Work slowly when operating the puller in order to prevent any sudden or unexpected displacement of parts being removed.

Never strike the spindle with a hammer or any other object.

6.2 Puller Installation and Operation

⚠ WARNING

Before operating any high force tool equipment, it is mandatory that the operator has a full understanding of all instructions and safety precautions included in this manual, and of all applicable local safety regulations and laws. If there are any questions or concerns, contact the Enerpac Technical Service Department or your local Enerpac distributor.

Steps for internal parts

1. Place the puller inside the workpiece. Refer to Figure 5, views 1 through 6 during the following steps.
2. Position the jaw tips at the bottom of the part to be removed.
3. Grasp the puller with one hand and turn the spindle clockwise with the other hand until jaws securely grip the circumference of the shaft.
4. Insert the slide hammer shaft into the spindle.
5. Turn the slide hammer shaft clockwise until is totally threaded into the spindle.
6. Repeatedly strike the hammer against the handle of the slide hammer shaft until the workpiece is removed. Be sure to keep the shaft in line with the component.

⚠ WARNING

To avoid personal injury, always operate the slide hammer with one hand on the hammer and the other on the shaft handle. Failure to keep hands clear of the impact area of the slide hammer can result in personal injury.

Steps for external parts

1. Place the puller on the workpiece. Refer to Figure 6, views 1 through 3 during the following steps.
2. Position the jaw tips at the bottom of the part to be removed.
3. Grasp the puller with one hand and turn the spindle clockwise with the other hand until jaws securely grip the circumference of the shaft.
4. Proceed with steps 4, 5 and 6 of the *Steps for internal parts* section in order to extract the external part. Refer to Figure 5.

7.0 INSPECTION, MAINTENANCE AND STORAGE

Maintenance is required when wear or damage occurs. Periodically inspect all components to detect any problem requiring maintenance or service.

- Periodically check the puller for loose, bent, worn or damaged components. Tighten or replace any such components immediately.
- Keep the puller free of dust and dirt.
- Keep the puller in good condition. Clean and lubricate the puller's spindle, to ensure good operation and long life.
- Store the puller in a clean, dry and secure location.
- If the puller requires repairs, refer to the Enerpac website for the repair parts sheet applicable to your puller model.

The puller must only be serviced by a qualified technician. For repair service, contact the Enerpac Authorized Service Center in your area.

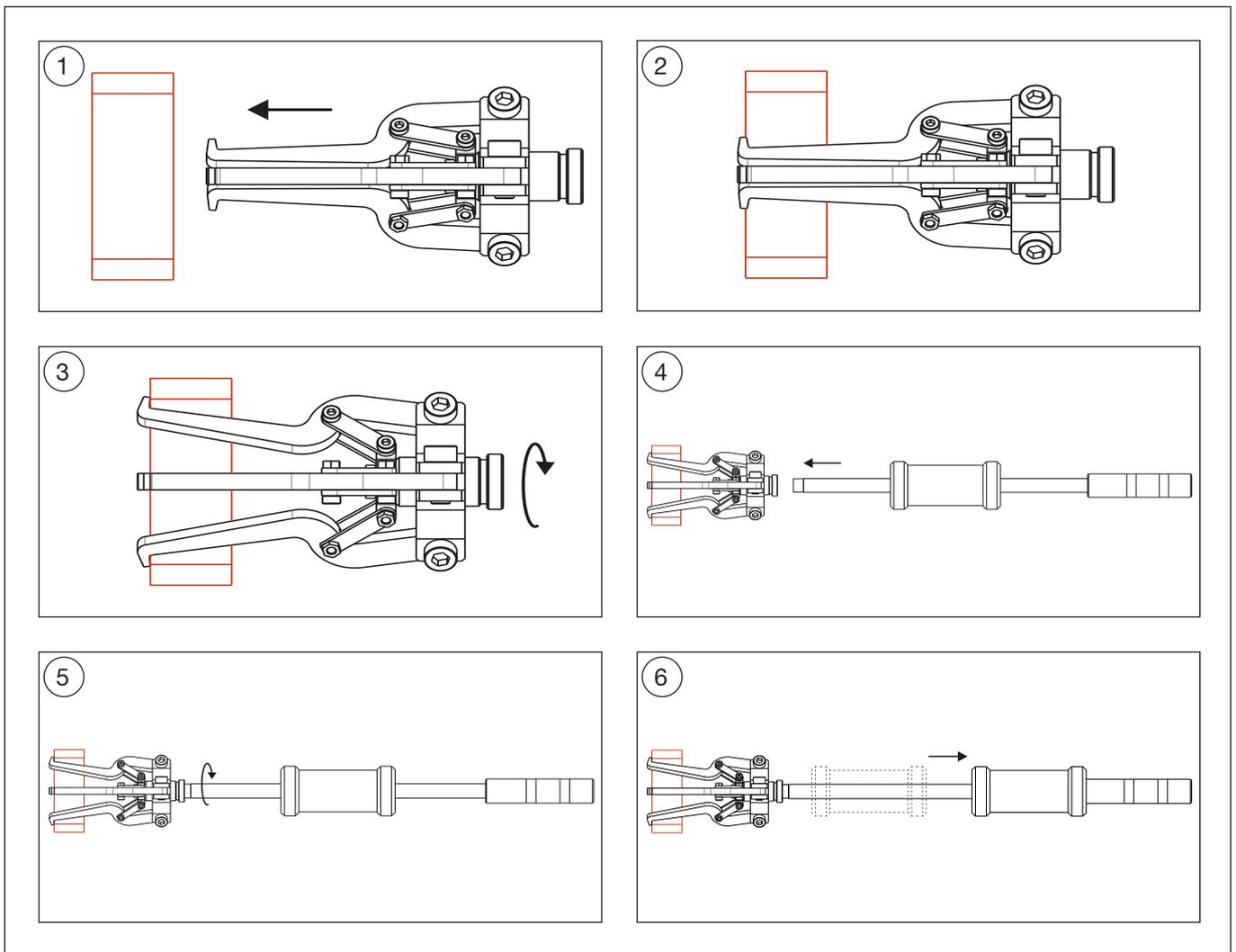


Figure 5: Puller Operation Steps. Extracting an Internal Part.

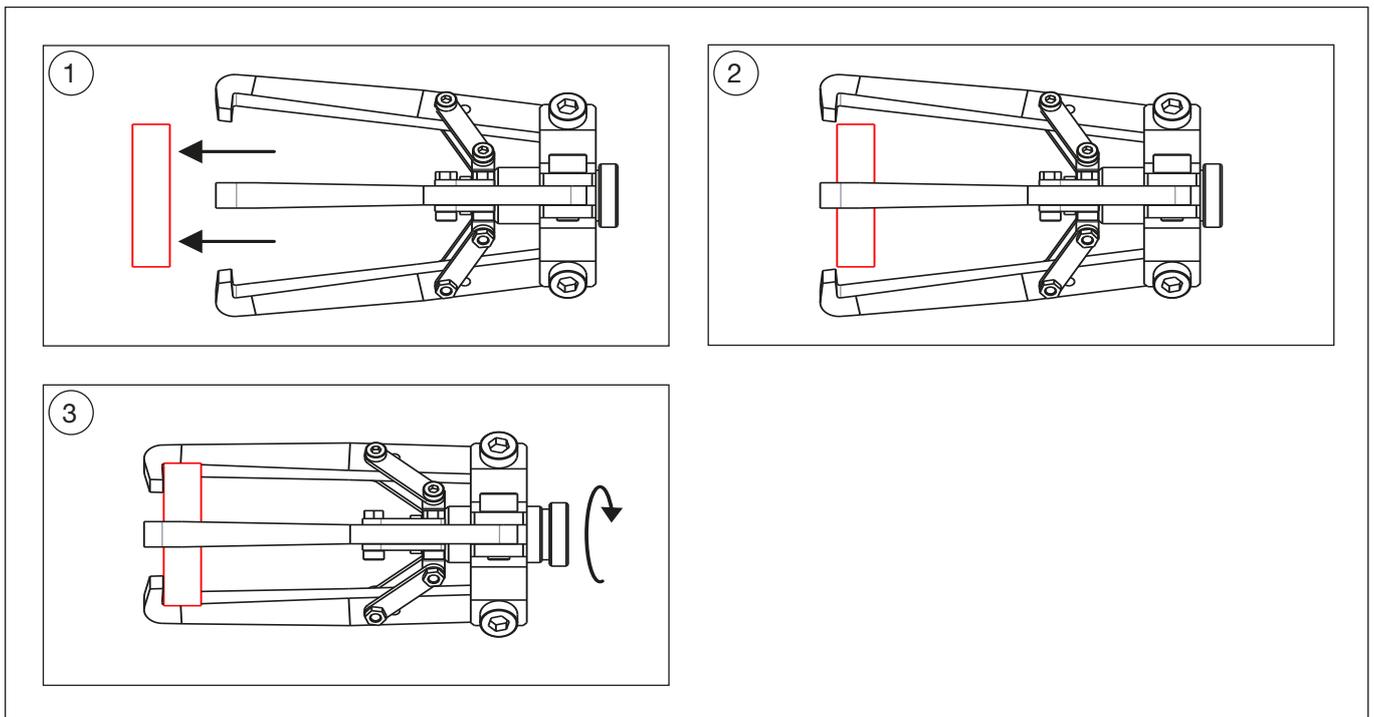


Figure 6: Puller Operation Steps. Extracting an External Part.

8.0 TROUBLESHOOTING

Refer to the troubleshooting guide when diagnosing puller operational problems. Please note that the troubleshooting guide is not all-inclusive, and should be considered only as an aid to help diagnose the most commonly anticipated problems.

Troubleshooting Guide, IPM3 Internal Mechanical Puller		
Symptom	Possible Cause	Solution
Jaws do not move freely or are difficult to move.	Spindle mechanism corroded or seized.	Inspect spindle mechanism. If corroded or seized, apply penetrating oil. Dismantle and clean mechanism as required.
One jaw moves independently.	Link damaged or broken.	Replace link. Replace complete lower body and links if needed.
Jaws move freely without turning the spindle.	Screw connecting lower body to spindle loose or missing.	Tighten screw. Replace missing component.

9.0 TECHNICAL DATA

9.1 Puller Major Dimensions

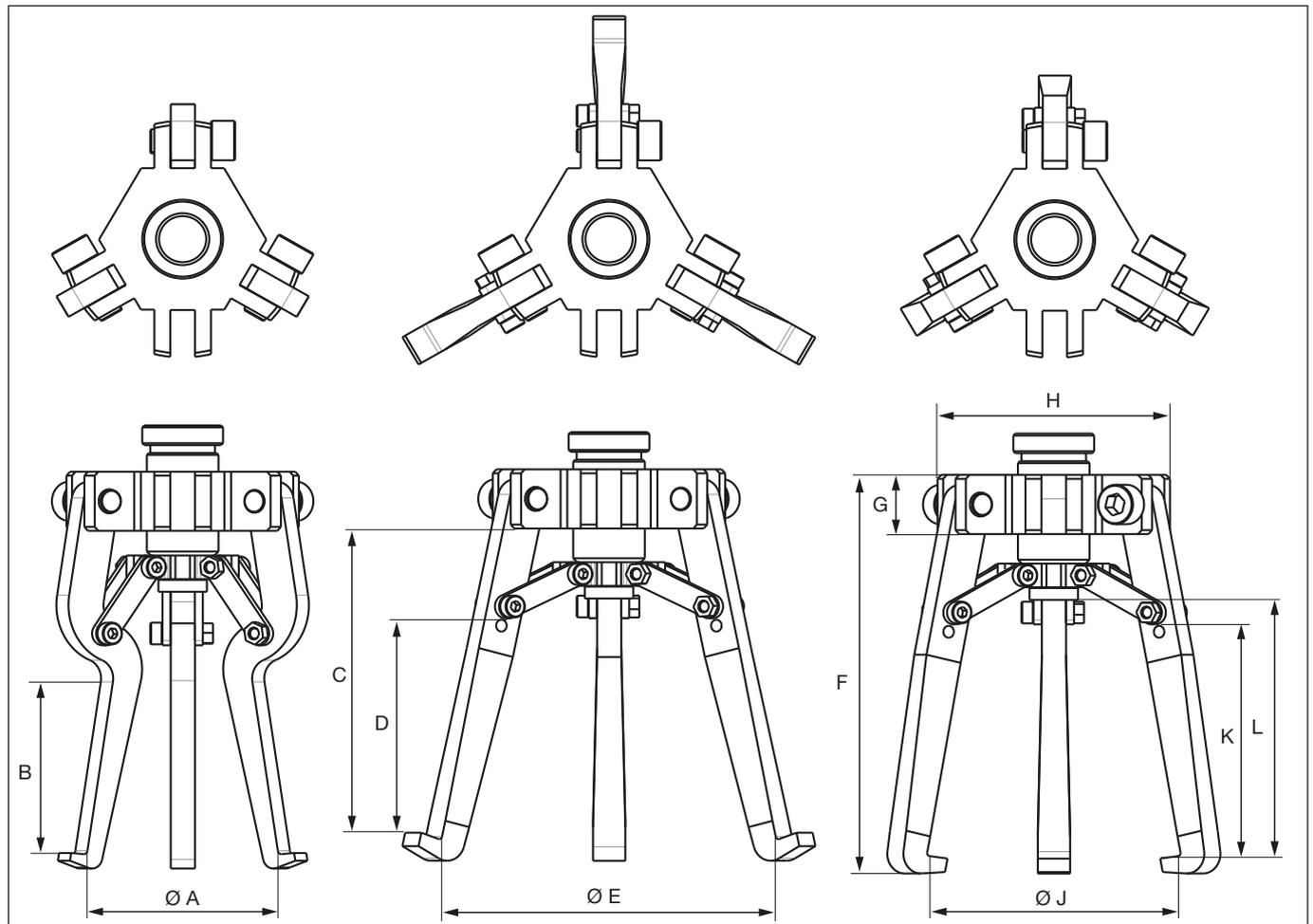


Figure 7: Puller Major Dimensions

	Ø A		B	C	D	Ø E		F	G	H	Ø J		K	L	
	min.	max.				min.	max.				min.	max.			
in.	0.98	2.36	1.77	3.11	2.28	2.36	3.94	4.01	0.59	2.36	0.59	2.95	2.16	2.75	1.10 lb
mm.	25	60	45	79	58	60	100	102	15	60	15	75	55	70	0.5 kg

9.2 Slide Hammer Major Dimensions

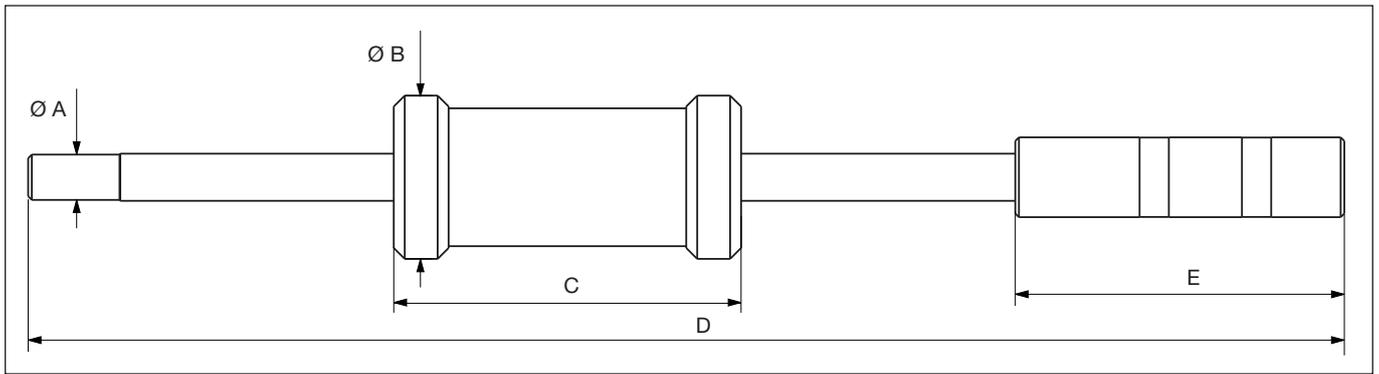


Figure 8: Slide Hammer Major Dimensions

	ØA	ØB	C	D	E	
in.	1/2" UNF-20	1.77	3.74	14.17	3.54	3.08 lb
mm.		45	95	360	90	1.4 kg

9.3 Major Dimensions - Spindle and Jaws

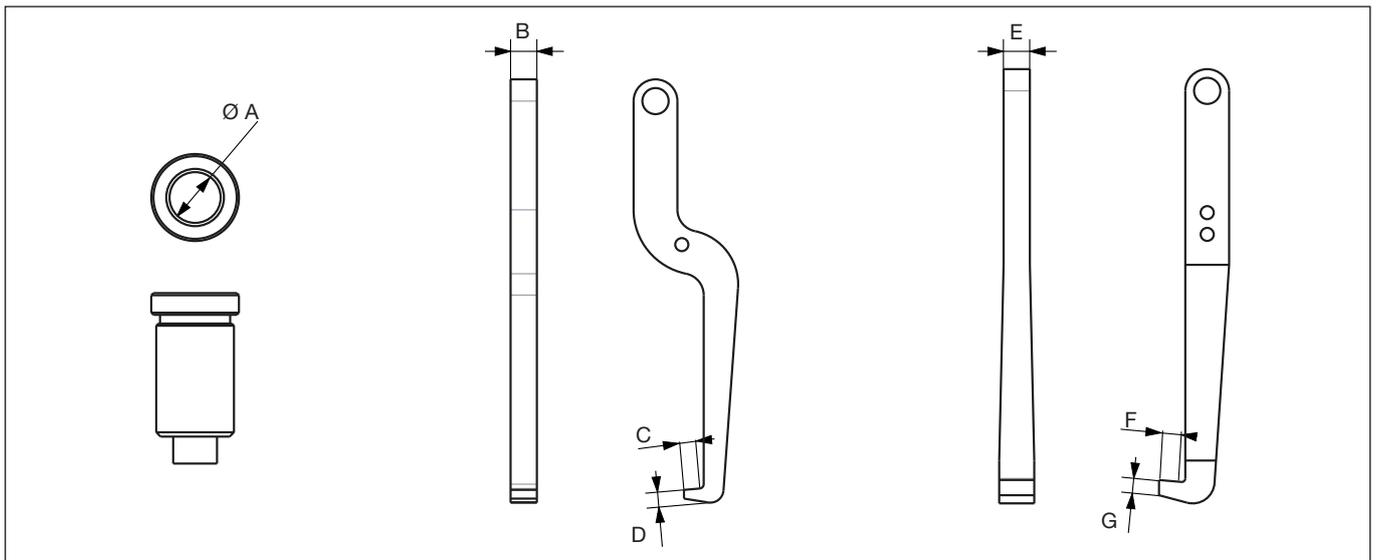


Figure 9: Major Dimensions - Spindle and Jaws

	ØA	B	C	D	E	F	G
in.	1/2" UNF-20	0.24	0.14	0.14	0.24	0.20	0.18
mm.		6	3.6	3.46	6	5.15	4.71

