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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 Sync Grip 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.
- Know the puller rated capacity before beginning any work.
- 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 center bolt 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 adjusting rod. Stop tightening if the adjusting rod bends, or if deformation of the jaws occurs.
- Do not use puller if threads on adjusting rod and/or body are damaged or worn. Do not use puller if adjusting rod is bent.
- Apply force gradually. Align puller grip 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 adjusting rod 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 CONFORMANCE TO NATIONAL AND INTERNATIONAL STANDARDS



Enerpac declares that this product has been tested and conforms to applicable standards and is compatible with all CE Requirements. A copy of an EU Declaration of Incorporation is enclosed with each shipment of this product.

4.0 PRODUCT DESCRIPTION

The SGM-Series Sync Grip Puller can be used to remove gears, bearings, pulleys and other similar shaft mounted parts.

The puller's self centering closing system means that all jaws move at the same time, reducing the chance of damage to the puller components and to the item being removed.

Five different puller models are available in rated capacities of 1 to 20 US Tons [8.9 to 177.9 kN]. Refer to the documentation provided with your shipment for model numbers and additional product data.

5.0 SETUP AND ASSEMBLY

5.1 Handling Large Pullers

- Use a crane and slings of suitable rated capacity to lift and unload the puller.
- Know the weight of the complete puller including puller body, adjusting rod and jaws.
- Be careful when lifting the puller while it is in the vertical position, as the jaws will close.
- If needed, support and reposition the puller with slings so that it can be used horizontally. When repositioning the puller from the horizontal to the vertical position, incline the puller slowly and carefully.

5.2 Configurations

Models SGM01, SGM04, SGM07 and SGM10 can be configured as either a two-jaw or three-jaw grip puller. Model SGM20 can be assembled only in the three-jaw configuration. See Figure 2 for jaw mounting details.

A three-jaw grip puller provides a more stable and secure grip than a two-jaw grip puller, resulting in a more even pulling force. For this reason, the three-jaw configuration should be used whenever possible.

Extended reach "long" jaws, are available as an optional accessory for models SGM10 and SGM20.

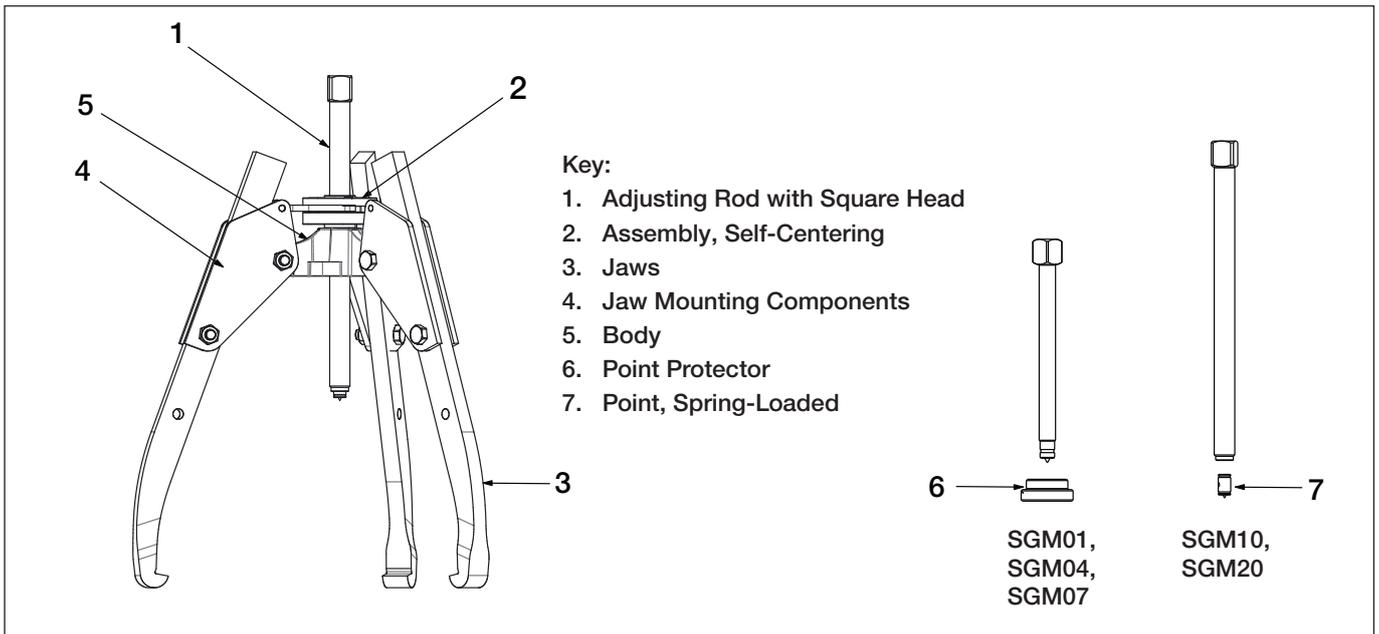
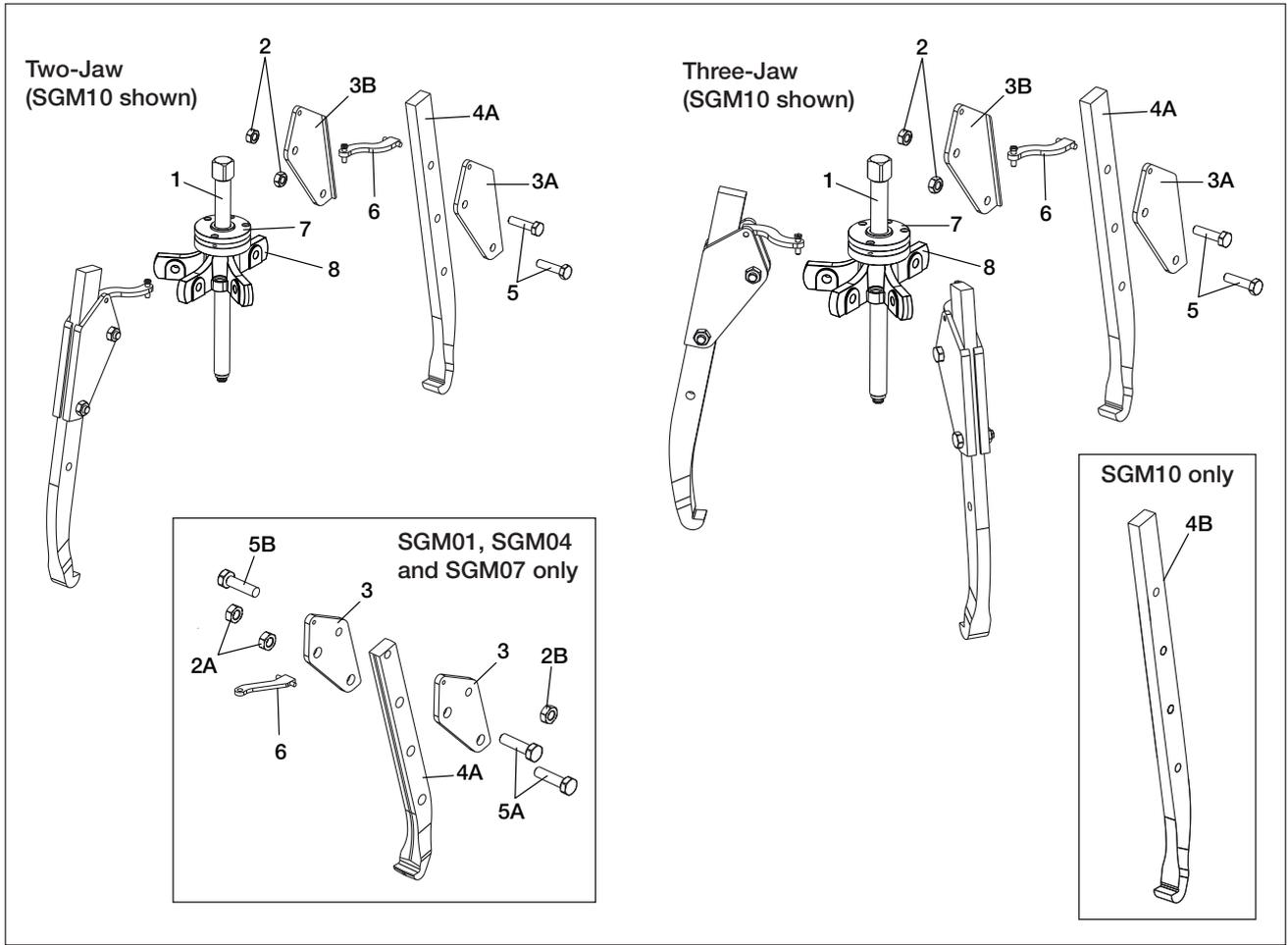
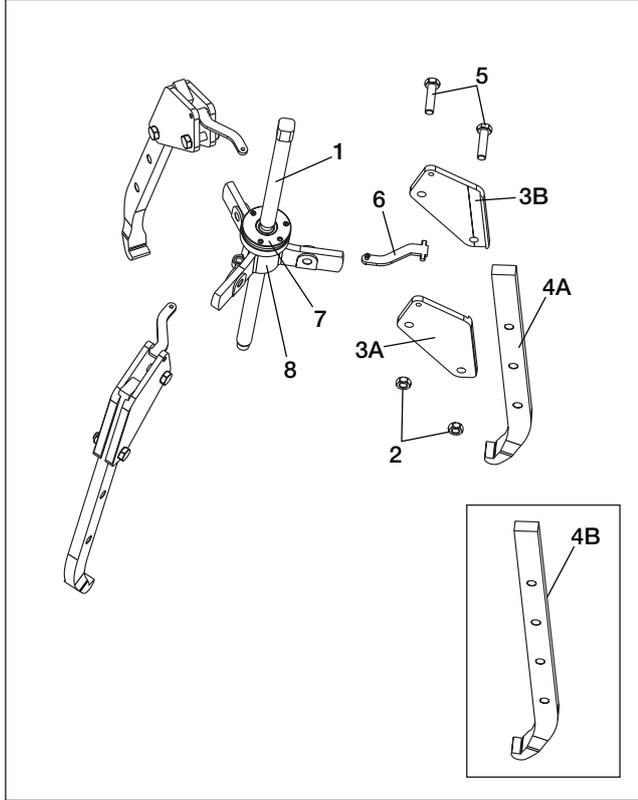


Figure 1, Features and Major Components, SGM-Series Sync Grip Puller



**Two and Three-Jaw Configurations
(Models SGM01, SGM04, SGM07 and SGM10)**



**Three-Jaw Configuration
(Model SGM20)**

Key:

- 1. Adjusting Rod with Square Head
- 2. Hex Nut (SGM10, SGM20)
- 2A. Hex Nut (SGM01, SGM04, SGM07)
- 2B. Hex Nut (SGM01, SGM04, SGM07)
- 3. Plate (SGM01, SGM04, SGM07)
- 3A. Plate, Left-Hand (SGM10, SGM20)
- 3B. Plate, Right-Hand (SGM10, SGM20)
- 4A. Jaw, Standard Length (All Models)
- 4B. Jaw, Extended Reach (Optional - SGM10, SGM20)
- 5. Capscrew (SGM10, SGM20)
- 5A. Capscrew (SGM01, SGM04, SGM07)
- 5B. Capscrew (SGM01, SGM04, SGM07)
- 6. Strap
- 7. Assembly, Self-Centering
- 8. Body

Note: Standard length jaws (item 4A) are included with all SGM-Series Sync Grip Pullers.

Extended reach “long” jaws (item 4B) are an optional accessory for models SGM10 and SGM20 only.

Figure 2, Setup and Assembly

5.3 Adjusting Rod Point and Point Protector

- Models SGM01 SGM04 and SGM07 feature a standard adjusting rod, with a tempered non-retractable point. These models **MUST** be used with a point protector if the shaft end does not contain a drilled center hole. See Figure 3.
- Models SGM10 and SGM20 feature a special adjusting rod which contains a spring-loaded retractable point. The point engages if the shaft end has a drilled center hole or depression. It automatically retracts if the shaft end is flat. See Figure 4. No point protector is required for these models.

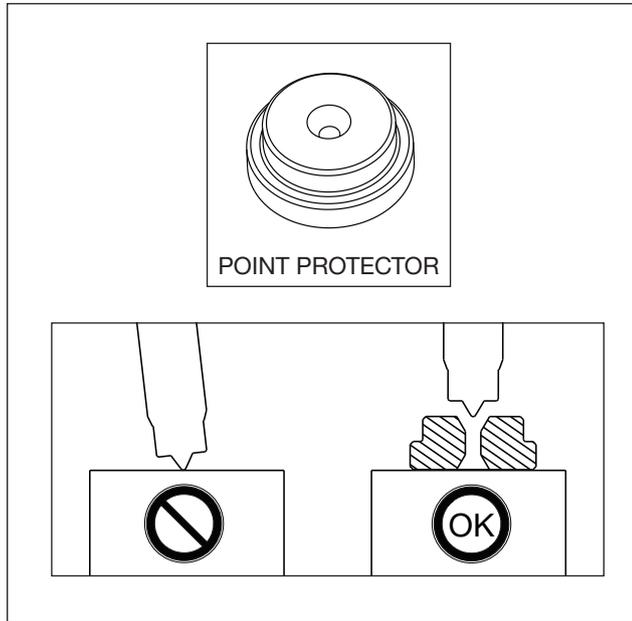


Figure 3, Point Protector

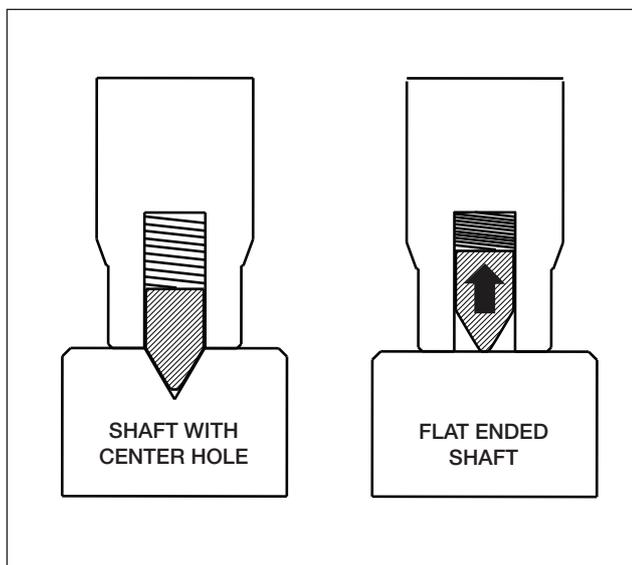


Figure 4, Retractable Point
(Models SGM10 and SGM20)

5.4 Jaw Mounting Positions and Adjusting Rod

- Install each jaw using the lowest mounting holes allowable for the application being performed. This will reduce the amount of jaw and adjusting rod deformation in the event of great force. See Figure 5.

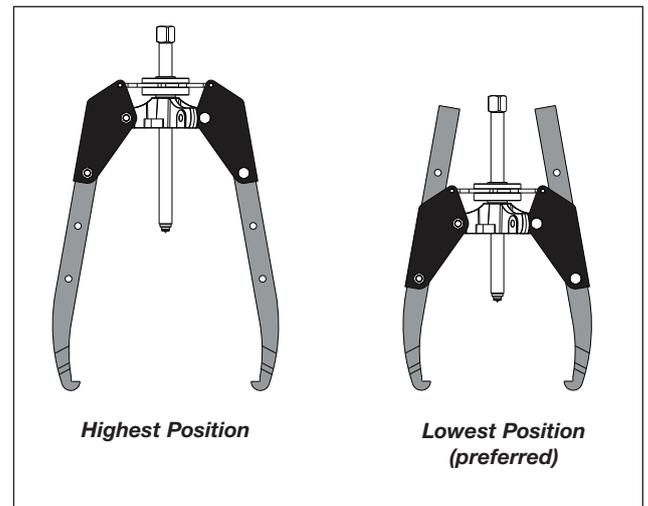


Figure 5, Jaw Mounting Positions (typical)

- As the adjusting rod is turned in the clockwise direction, it protrudes an increased distance below the puller body. The length of the rod that is under load increases, and there is a greater chance that the rod will become bent during puller operation. See Figure 6, Views A, B and C.
- A spacer of appropriate size can be placed in between the tip of the adjusting rod and the end of the shaft. This will reduce the possibility of adjusting rod deformation. The spacer should be a solid steel billet with flat ends. Be certain that the spacer diameter is larger than that of the adjusting rod.
- The amount of adjusting rod protrusion can also be reduced by installing the jaws using the next lowest set of mounting holes.
- Install the jaws using the highest set of mounting holes only if it is necessary to provide additional clearance for large components. See Figure 6, View D.

6.0 OPERATION

6.1 General Puller Use Instructions

- Be sure that the puller adjusting rod is cleaned and greased before use.
- Be sure that the jaws are properly centered on the pulley or other 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 adjusting rod with a hammer or any other object.

6.2 Puller Installation and Operation

NOTICE 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.

- Assemble the jaws on the puller body. Tighten mounting bolts and nuts.
- Install the puller on the pulley or other part to be removed. See Figure 7 for examples.

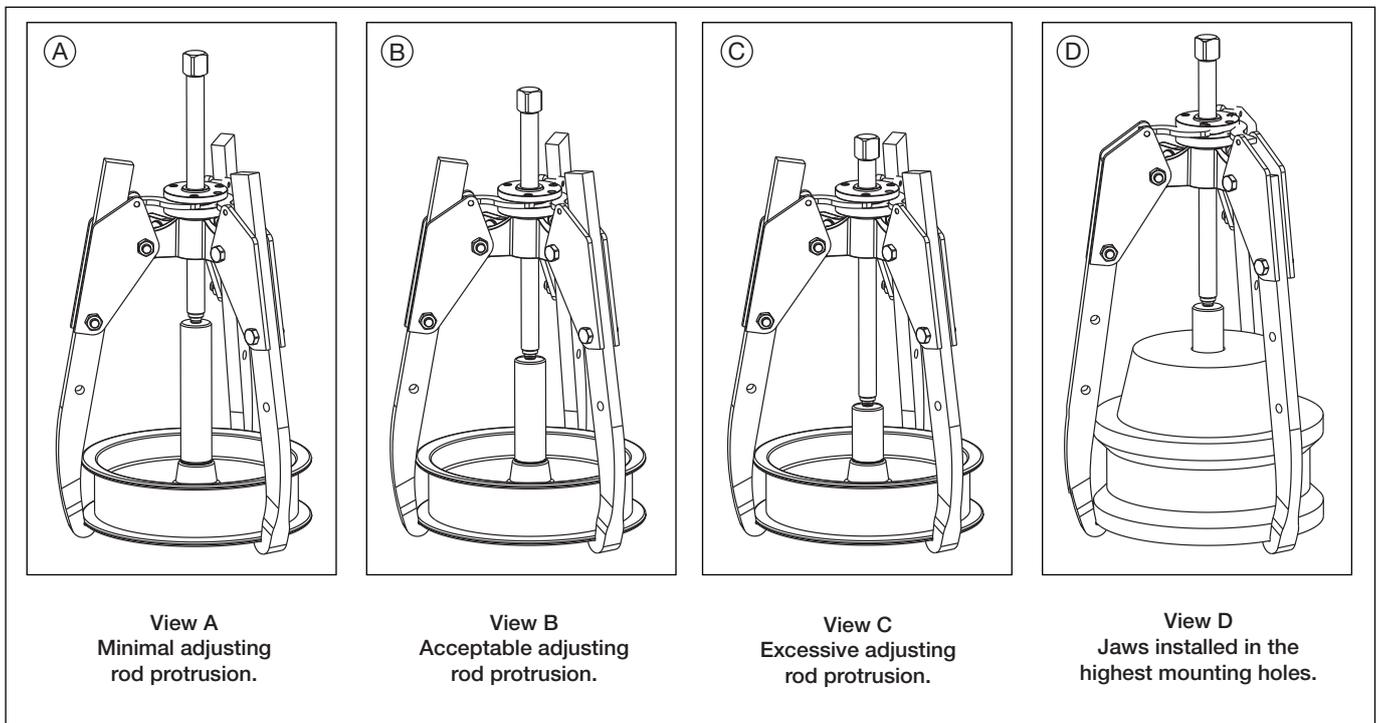


Figure 6, Jaw Mounting Positions and Adjusting Rod Height

- For models SGM01, SGM04 and SGM07, if the end of the shaft is flat, install the point protector between the shaft end and the adjusting rod point. Refer to Section 5.3.
- Rotate the adjusting rod clockwise by hand, until the pointed end of the rod contacts the recessed area of the shaft or of the point protector (if used).
- Using a suitable wrench, slowly turn the adjusting rod to apply force, continuing until the part is removed.

⚠ WARNING Limit applied torque as required to ensure safe operation. Apply force using a hand wrench. NEVER use a powered wrench to turn the adjusting rod. Serious personal injury or death may result if these precautions are not observed.

- During operation, continuously monitor the puller for indications of deformation. If the adjusting rod bends or any jaw deformation is noticed, stop tightening the adjusting rod immediately. See Figure 7.

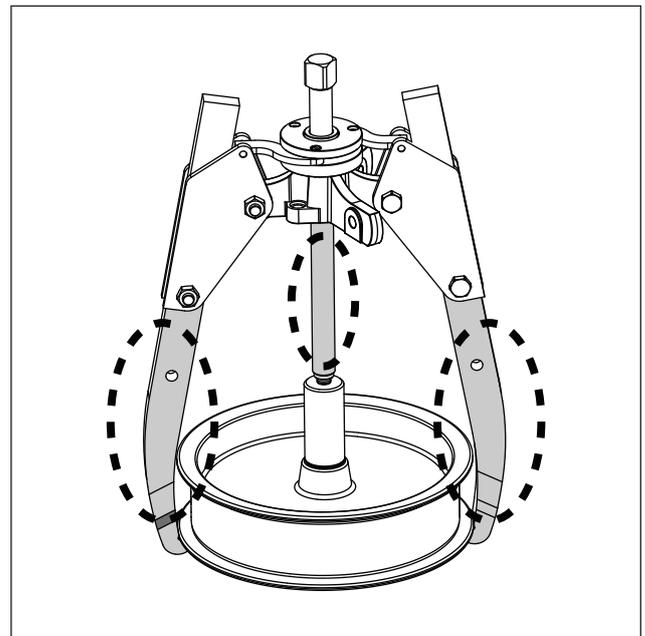


Figure 8, Checking for Deformation

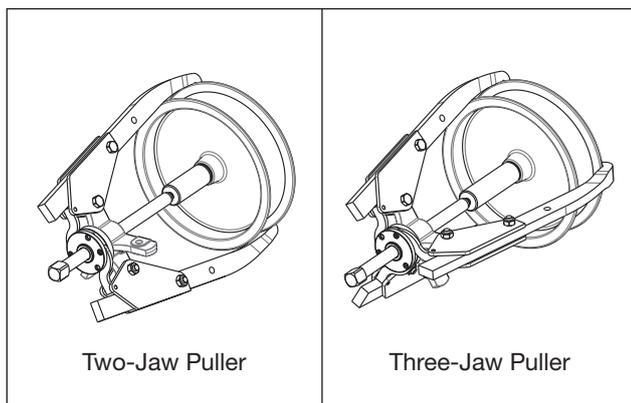


Figure 7, Pulley Removal (typical)

6.3 Inspection, Maintenance and Storage

Maintenance is required when wear or damage is noticed. 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 adjusting rod and jaws frequently, from top of threaded area to tip, 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.

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

7.0 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.

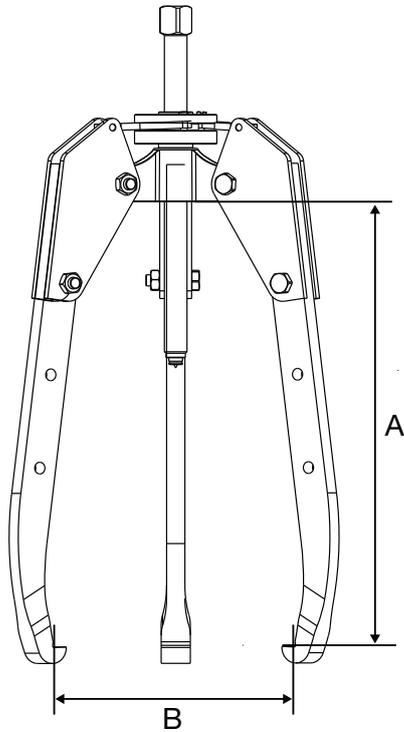
For repair service, contact your nearest Enerpac Authorized Service Center.

<i>Troubleshooting Guide, SGM-Series Sync Grip Mechanical Pullers</i>		
Symptom	Possible Cause	Solution
1. Jaws do not move freely or are difficult to move.	Self-centering mechanism corroded or seized.	Inspect self-centering mechanism. If corroded or seized, apply penetrating oil. Dismantle and clean mechanism as required.
2. One jaw moves independently.	Self-centering strap damaged or broken.	Replace self-centering strap. Replace complete self-centering mechanism if needed.
3. Adjusting rod will not turn or requires excessive effort to turn.	a. Corroded threads on adjusting rod or puller body.	If parts are seized, apply penetrating oil. Inspect threads on adjusting rod and cylinder body. Dismantle and clean components as required.
	b. Worn or damaged threads.	Replace adjusting rod and/or puller body as required. Do not use puller if threads are worn or damaged.
	c. Adjusting rod is bent.	Replace adjusting rod. Do not use puller if adjusting rod is bent.

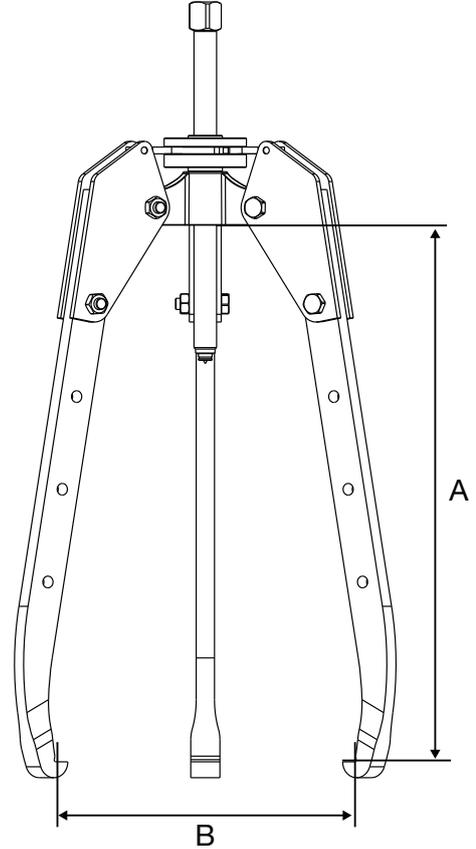
8.0 PRODUCT DATA

8.1 General Specifications and Dimensions

Refer to Section 8.2 for adjusting rod dimensions. Refer to Section 8.3 for jaw dimensions.



Standard Length Jaws
(all models)

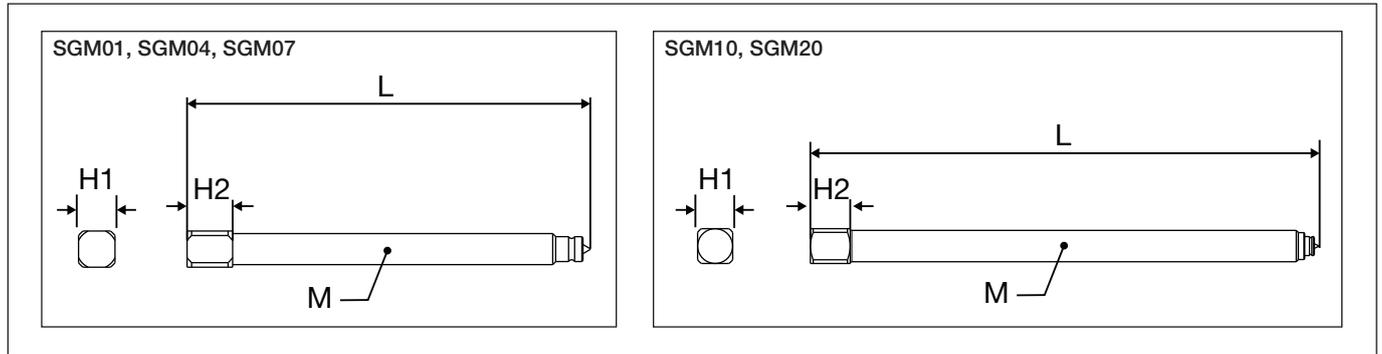


Extended Reach Long Jaws
(Optional Accessory - SGM10 and SGM20 only)

Puller Model No.	Jaw Length	Capacity		Maximum Reach		Maximum Spread		Weight *	
		US Tons	kN	A		B		lb	Kg
				in	mm	in	mm		
SGM01	Std.	1	8.9	4.13	105	4.33	110	1.8	0.8
SGM04	Std.	4	35.6	7.28	185	6.89	175	4.4	2.0
SGM07	Std.	7	62.3	8.86	225	9.45	240	14.3	6.5
SGM10	Std.	10	89.0	16.14	410	13.78	350	32.0	14.5
	Long	10	89.0	19.29	490	15.94	405	35.3	16.0
SGM20	Std.	20	177.9	23.62	600	26.77	680	122.3	55.5
	Long	20	177.9	25.20	640	28.35	720	135.5	61.5

* Approximate weight of assembled puller, including puller body components, adjusting rod and three jaws.

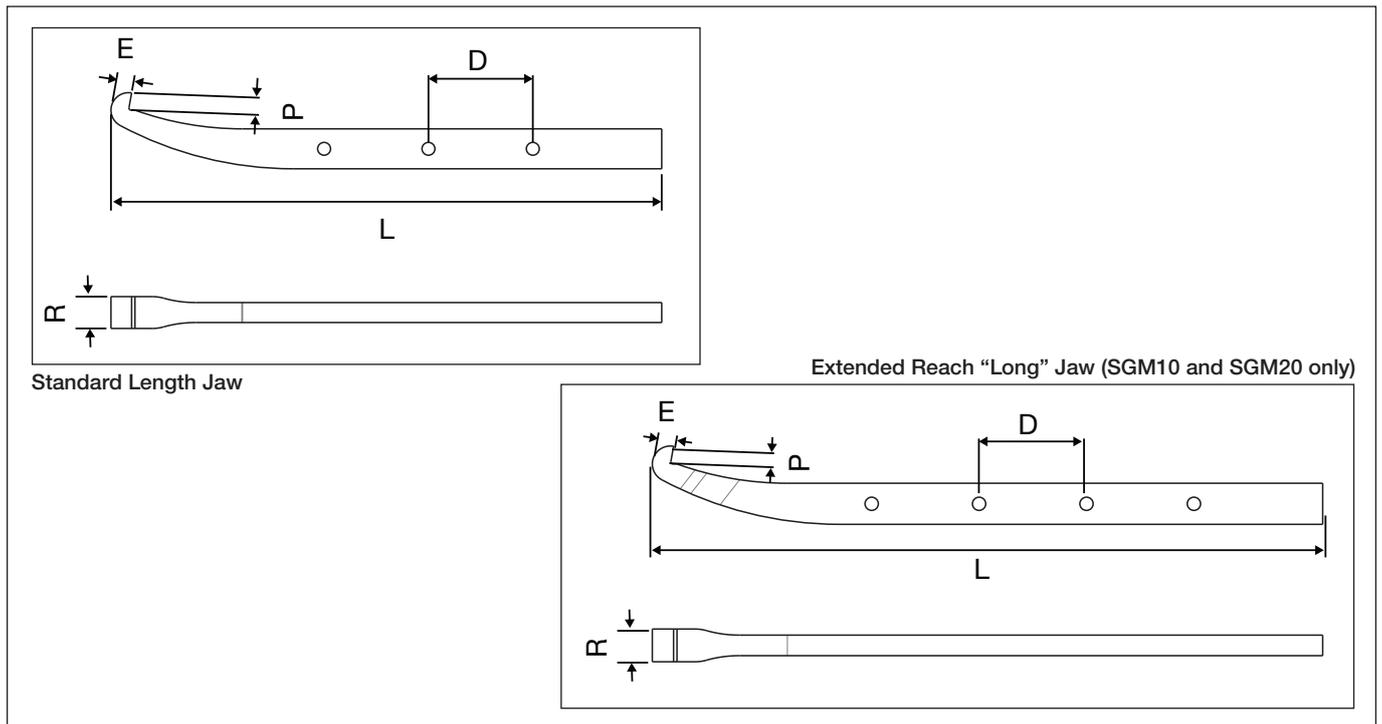
8.2 Specifications and Dimensions - Puller Adjusting Rod



Puller Model No.	Length		Square Size		Square Depth		Thread Size
	L		H1		H2		M
	in	mm	in	mm	in	mm	
SGM01	4.88	124	0.47	12	0.55	14	M10 x 1.0
SGM04	6.97	177	0.63	16	0.79	20	M14 x 1.5
SGM07	9.25	235	0.75	19	0.94	24	M18 x 1.5
SGM10	12.64	321	0.87	22	0.98	25	M20 x 1.5
SGM20	20.08	510	1.38	35	1.50	38	1-3/8" UNF

Note: Models SGM10 and SGM20 are equipped with spring-loaded retractable point.

8.3 Specifications and Dimensions - Puller Jaws



Puller Model No.	Jaw Length	End Surface		Width		Total Thickness		Length		Distance Between Holes	
		P		R		E		L		D	
		in	mm	in	mm	in	mm	in	mm	in	mm
SGM01	Std.	0.28	7	0.30	7.5	0.31	8	5.00	127	0.75	19
SGM04	Std.	0.31	8	0.83	21	0.30	7.5	8.62	219	2.01	51
SGM07	Std.	0.31	8	0.98	25	0.39	10	10.39	264	1.75	44.5
SGM10	Std.	0.59	15	0.98	25	0.49	12.5	17.17	436	3.27	83
	Long	0.59	15	0.98	25	0.49	12.5	20.31	516	3.27	83
SGM20	Std.	0.94	24	1.61	41	0.87	22	27.48	698	4.92	125
	Long	0.94	24	1.61	41	0.87	22	32.40	823	4.92	125

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