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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.

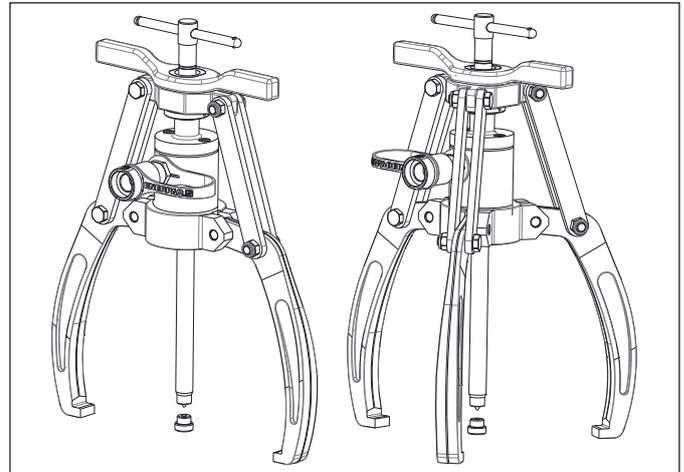
If you have never been trained on high force tool safety, consult your distributor or service center for information about an Enerpac Safety Course.

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 - Hydraulic Lock 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 hydraulic pressure could result in loss of balance, causing damage or injury.
- Never overload the puller or accessories. Never exceed puller maximum capacities or maximum allowable hydraulic working pressures. Refer to Sections 10.1 and 10.2 of this manual for detailed puller capacity information and pressure limits. Also observe and follow all operating precautions communicated in Section 7.0 of this manual.
- Be aware that puller capacity will vary, depending on the puller model, configuration and other variables.

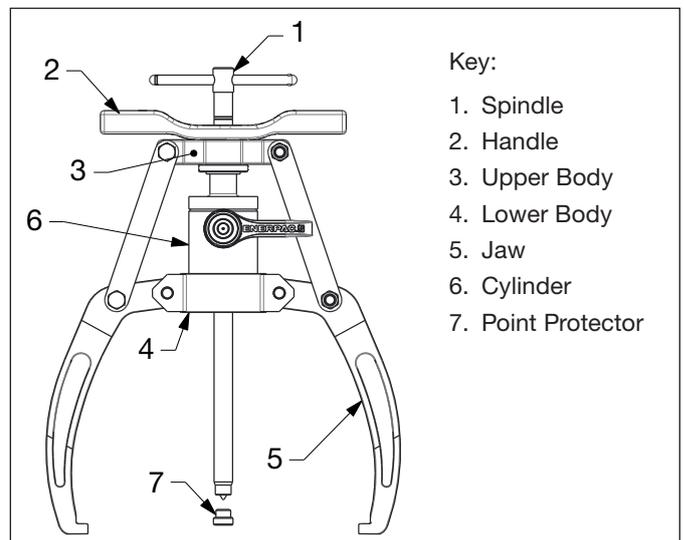
- Never attempt to pry the puller by inserting tools or other objects between the jaws. This may cause spindle damage.
- Use hydraulic pressure gauges to verify proper operating pressure in the hydraulic system. Do not exceed maximum pressure limits of the lowest rated component in your system. Always use high pressure hoses and fittings.
- 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 maximum force, and the part still will not move, then use a larger capacity puller. Use of a sledge hammer to loosen parts is not recommended.
- Do not use puller if threads on spindle, threaded collar or hydraulic cylinder are damaged or worn. Do not use puller if spindle is bent.
- Do not over-extend the hydraulic cylinder. Do not operate the cylinder beyond the limits of its rated stroke.
- Align puller grip jaws as required. Be sure the setup is rigid and that puller is square with the work. Apply force gradually.
- Never use a puller that is damaged, altered or in need of repair.
- Always be sure that the spindle is loosened and hydraulic pressure is completely relieved 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.

2.3 Additional Hydraulic Safety Precautions



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

- Do not remove or disable the pump relief valve. Never set the relief valve to a higher pressure than the maximum rated pressure of the pump.
- The puller hydraulic cylinder is designed for a maximum pressure of 10,150 psi [700 bar]. Do not connect a pump with a higher pressure rating to the cylinder.
- To avoid personal injury and equipment damage, make sure all hydraulic components are rated for at least 10,150 psi [700 bar] working pressure.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauge(s) in the system to monitor operating pressure. It is your window to see what is happening in the system.
- Make sure that all system components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges and corrosive chemicals.
- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, seek medical attention immediately.
- Always visually inspect the puller and puller hydraulic system 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 hydraulic cylinder that is leaking oil. Do not use a cylinder that is damaged, altered or in need of repair.
- Do not loosen plugs, relief valves or any other hydraulic



Key:

1. Spindle
2. Handle
3. Upper Body
4. Lower Body
5. Jaw
6. Cylinder
7. Point Protector

Figure 1, Features and Major Components

components unless hydraulic pressure is completely relieved.

- Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose, leading to premature hose failure.
- Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- Always read, understand and follow all safety precautions and instructions, including those that are contained within the procedures of this manual.



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

- Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or strap.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance, do not expose equipment to temperatures of 150°F [65°C] or higher. Protect all hydraulic equipment from weld spatter.
- 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.



- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Center in your area.
- To help ensure proper operation and best performance, use of Enerpac oil is strongly recommended.

3.0 CONFORMANCE TO NATIONAL AND INTERNATIONAL STANDARDS

CE 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 is enclosed with each shipment of this product.

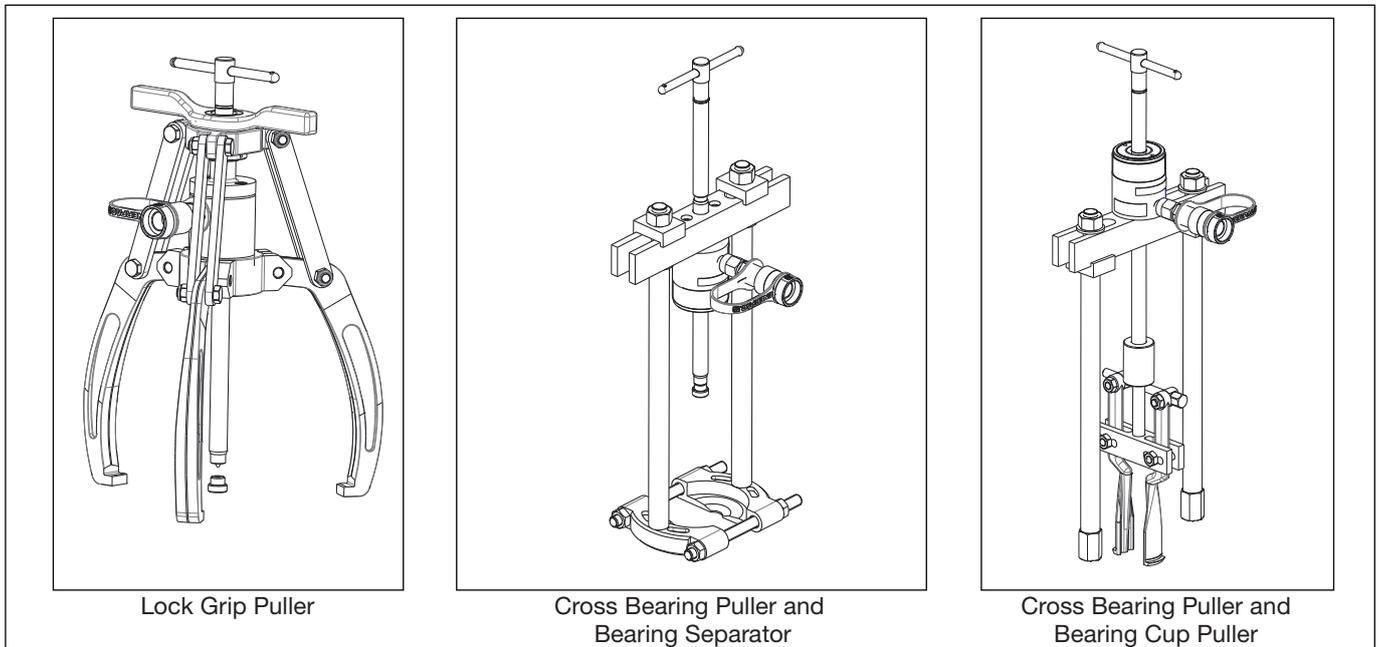


Figure 2, Hydraulic Puller Configurations (Typical)

4.0 PRODUCT DESCRIPTION

4.1 Lock Grip Hydraulic Puller (LGH-Series)

The Lock Grip Hydraulic puller can be used to remove and install gears, bearings and pulleys.

Different puller models in a variety of capacities are available. Refer to the documentation provided with your shipment for model numbers and additional product data.

The Lock Grip puller's synchronized closing system means that all jaws move in unison, reducing the chance of damage to the puller components and making the puller easier and safer to use.

4.2 Hydraulic Set (LGHS-Series)

The Enerpac Hydraulic Set includes the following items:

- Hydraulic Lock Grip Puller (LGH-Series).
- Hydraulic pump, electric, air, battery or hand operated.
- Hydraulic hose, 6 feet [1.8 m] long.
- Hydraulic pressure gauge and gauge adapter.
- Hydraulic cylinder with coupler.

The specific items included in the Hydraulic Set will vary, depending on the puller size and the pump type ordered.

4.3 Hydraulic Master Set (LGHMS-Series)

The Enerpac Hydraulic Master Set includes all the items of the Hydraulic Set plus the following additional items:

- Bearing Cup Puller Attachment
- Cross Bearing Puller Components
- Bearing Separator Attachment
- Mounting and attaching hardware

These attachments allow the puller to be configured as a bearing cup puller or as a cross style bearing puller, refer to Figure 2. They are designed for work environments where clearance prevents a direct application of the puller jaws.

For these configurations, the grip puller jaws, puller body and self-centering mechanism are not used.

The specific items included in the Hydraulic Master Set will vary, depending on the puller size and the pump type ordered.

5.0 HYDRAULIC SYSTEM

5.1 Hydraulic Component Requirements

All hydraulic components used with the puller, including pump, cylinder, pressure gauge, hoses and fittings must be rated for at least 10,150 psi [700 bar] maximum working pressure.

The pump must include a safety relief valve that opens if the maximum hydraulic working pressure of 10,150 psi [700 bar] is exceeded.

⚠ WARNING Pump safety relief valve must not be set higher than 10,150 psi [700 bar]. Failure to observe this precaution could result in high pressure oil leaks and/or catastrophic failure. Serious personal injury or death could result.

Electric, air and battery powered pumps must also include a user-adjustable relief valve, allowing the user to adjust the maximum working pressure to the correct setting for the puller application. For some puller configurations and applications, this setting will be less than the pump safety relief valve setting.

This information is provided for users who may wish to use the puller with the existing hydraulic components in their shop facilities. All hydraulic components included in an Enerpac Lock Grip Puller Set or Master Puller Set will conform to the stated specifications and requirements.

5.2 Hydraulic Cylinder

The hydraulic cylinder is pre-assembled in the body of the Lock Grip puller. When needed, the cylinder can be removed from the Lock Grip puller for use with various Master Puller Set components. Refer to the following table for hydraulic cylinder usage information:

| Hydraulic Cylinder Usage Information | | | | |
|--------------------------------------|----------------------------|------------------------------|-------------------|--------------------|
| Enerpac Cylinder Model No. | Lock Grip Puller Model No. | Master Puller Set Components | | |
| | | Cross Bearing Puller | Bearing Separator | Bearing Cup Puller |
| RWH101B100 | LGH210/310 | BHP112 | BHP181 | BHP180 |
| RWH121 | LGH214/314 | BHP172 | BHP282 | BHP190 |
| RCH202 | LGH224/324 | BHP272 | BHP292 | BHP280 |
| RCH603 | LGH253/364 | BHP672 | BHP682 | BHP580 |

⚠ WARNING Use only the Enerpac cylinder specified for your puller model. Improper operation and/or catastrophic failure could occur if a different cylinder is used. Serious personal injury or death may result.

5.3 Checking oil level

NOTICE Check the oil level in the pump reservoir with the cylinder fully retracted. Add oil if level is low. Refer to the pump instruction sheet for detailed instructions and oil type.

Be sure to use a high quality hydraulic oil. Use of Enerpac oil is strongly recommended.

5.4 Advancing and Retracting the Cylinder

- **To advance:** Close the pump release valve. Operate the pump to build pressure and advance the cylinder.
- **To retract:** Open the pump release valve to release pressure and retract the cylinder.

For detailed hydraulic component operating instructions, refer to the instruction sheet included with the pump, hose, pressure gauge and hydraulic cylinder. Completely observe and follow all communicated instructions and safety precautions.

5.5 Air Removal

To remove trapped air from the hydraulic circuit, fully advance and retract the puller cylinder several times while it is not under load. If possible, position the cylinder so that it is lower than the pump reservoir. Avoid pressure build-up as the cylinder is being cycled. Air removal is complete when cylinder motion becomes smooth.

6.0 SETUP AND ASSEMBLY

6.1 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 assembly, including puller, hydraulic cylinder and all attachments.
- If needed, support the puller with slings so that it can be used horizontally. When reorienting the puller from horizontal to the vertical position, incline the puller slowly and carefully.

6.2 Puller Configurations

The Lock Grip Puller may be purchased with accessories designed for special applications:

1. The Cross Bearing Puller
2. The Bearing Cup Puller
3. The Bearing Separator

Refer to Figure 8, Figure 9 and Figure 10 for assembly details. These accessories are described in Sections 7.4, 7.5 and 7.6.

7.0 INSTALLATION AND OPERATION

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 questions or concerns, contact the Enerpac Technical Service Department or your local Enerpac distributor.

7.1 Spindle Point Protector

All models feature a threaded spindle with a tempered steel point.

A point protector is packed with all LGH-Series models. To prevent damage, the point protector **MUST** be used if the shaft end does not contain a drilled center hole or depression. See Figure 3.

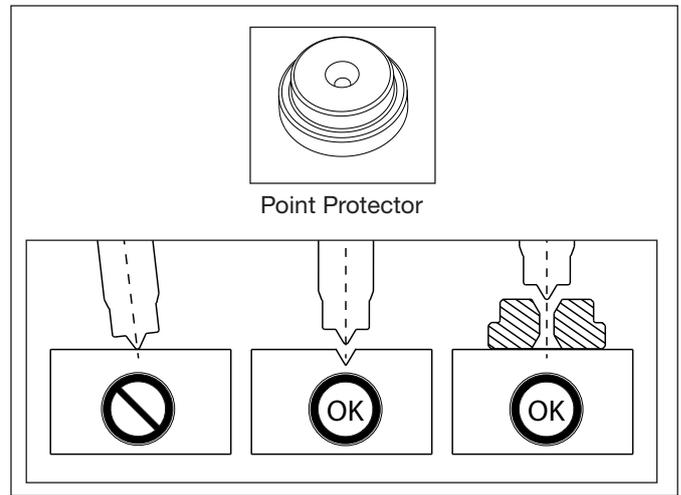


Figure 3, Point Protector

7.2 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.
- Position the point of the spindle into the center hole of the shaft or axle. If there is no center hole, use a point protector (included with all pullers).
- After mounting the puller on the part to be removed, be certain that the thread engagement indicator is visible. See Figure 4 for location. If the spindle is turned clockwise too many turns, the indicator will be hidden, indicating that the amount of thread engagement is not sufficient.

⚠ WARNING Do not operate the puller if the thread engagement indicator is not visible. Catastrophic failure could occur if the amount of thread engagement is not sufficient. Serious personal injury or death may result.

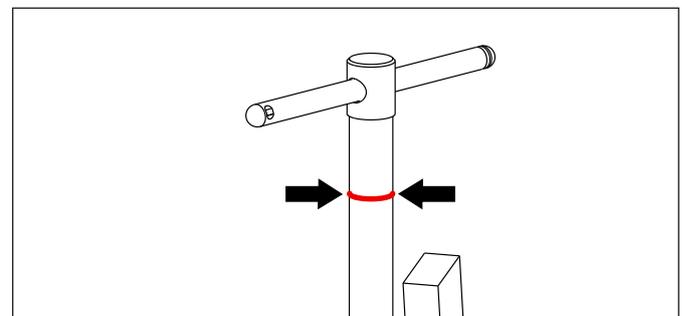


Figure 4, Thread engagement indicator (red band)

- Continuously monitor the hydraulic pressure gauge while operating the pump and puller. Stop the pump immediately if the maximum allowable hydraulic pressure for your puller model and configuration is reached.
- During operation, watch the puller for indications of jaw or spindle deformation. See Figure 5. If any deformation is noticed, stop the pump immediately.
- In some applications, the amount of deformation may be so small that it is not noticeable. Never rely on visible deformation to determine the puller's safe operating limits. Always monitor the hydraulic pressure gauge.
- Work slowly when operating the puller in order to prevent any sudden or unexpected displacement of parts being removed.

7.3 Puller Installation and operation

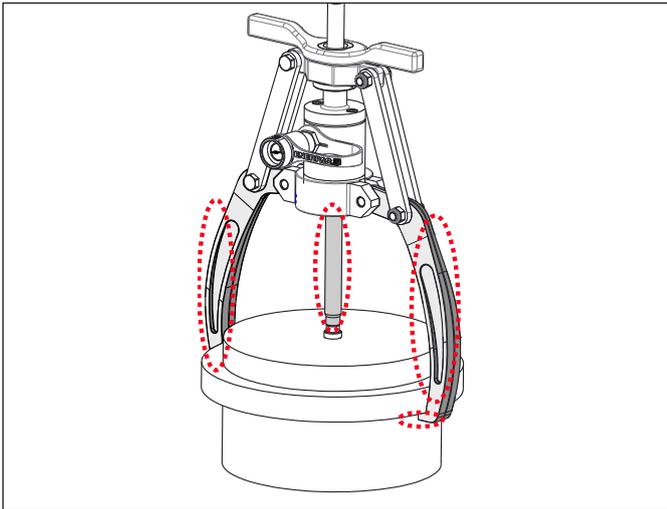


Figure 5, Checking for Deformation

⚠ WARNING Before operating 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.

1. Rotate the spindle to adjust the spindle height up or down. Rotate the handle to increase or decrease the jaw opening. Adjust the jaws and spindle to allow the puller to be mounted onto the workpiece. Refer to Figure 6, views 1 through 4 during the following steps.

Also refer to the tables contained in Figure 7 and Section 11.1 for information regarding workpiece maximum height and width limits (puller maximum reach and spread).

⚠ CAUTION The handle threads do not have a stop. Be careful not to fully unscrew the handle when adjusting the jaw opening. Puller jaws will loosen and open fully if threads become disengaged.

2. Place the puller on the workpiece. Position the jaws around the part to be removed and align the spindle point with the center of the shaft.

NOTICE If the end of the shaft is flat, install the point protector between the shaft end and the spindle point. Refer to Section 7.1.

3. Rotate handle clockwise until jaws securely grip the circumference of the shaft. Rotate spindle clockwise by hand until the bottom of the spindle contacts the recessed area of the shaft or the point protector (if used).

NOTICE The spindle and the jaws must engage the workpiece, and achieve at least the minimum reach and spread.

4. Apply pressure with the pump to drive the spindle against the work surface until the work piece is completely extracted.

⚠ WARNING

Overloading and catastrophic failure could occur if the stated maximum pressure limit for your puller model and configuration is exceeded. Serious personal injury or death may result.

Refer to Section 10.0 of this manual for the maximum hydraulic working pressure applicable to your Hydraulic Lock Grip Puller model.

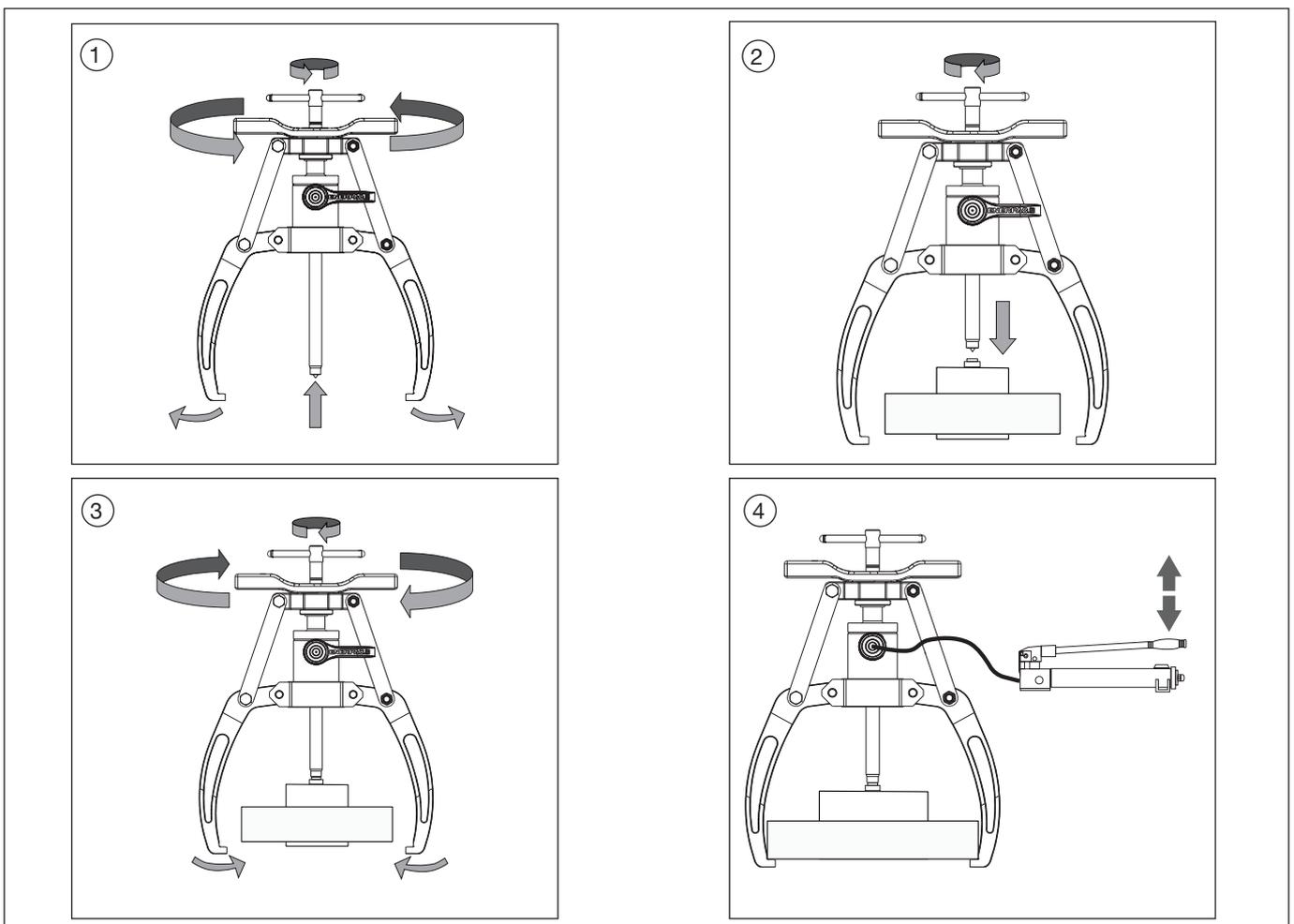


Figure 6, Puller Installation Steps

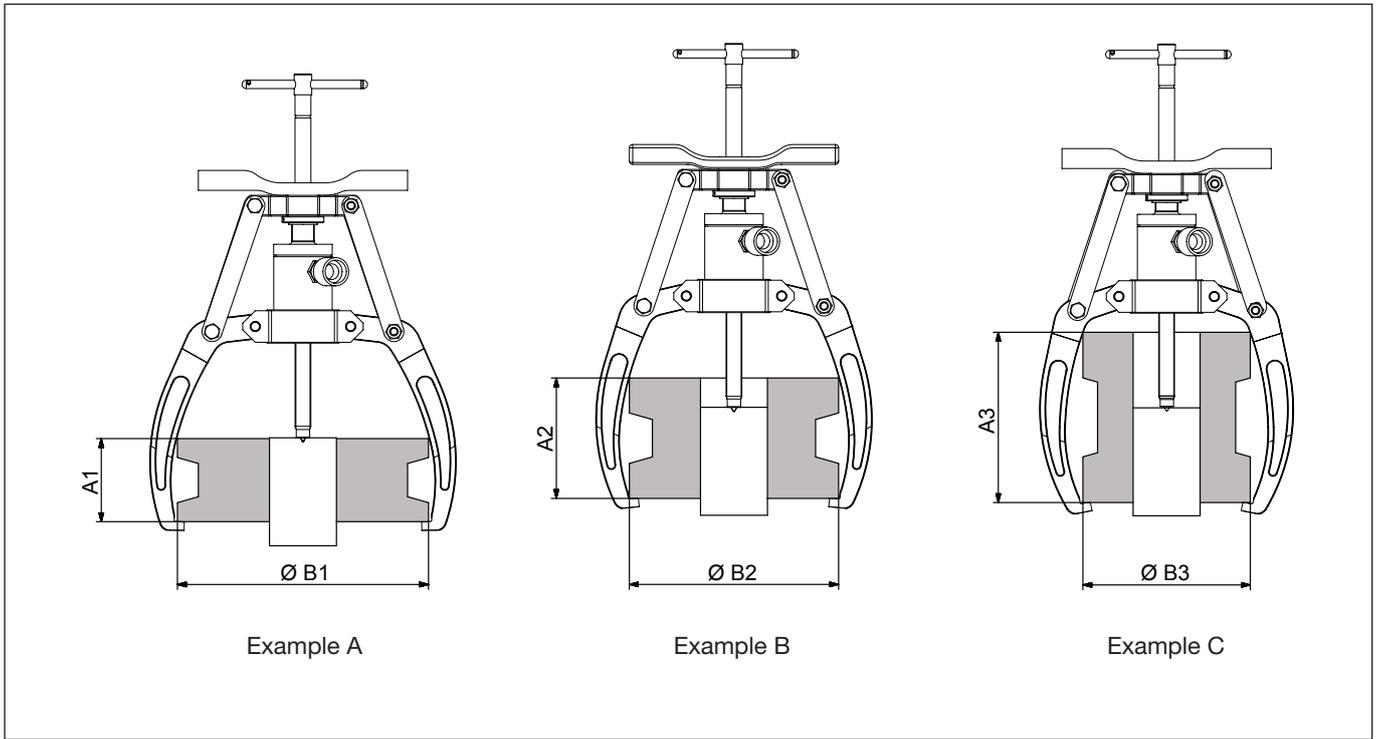
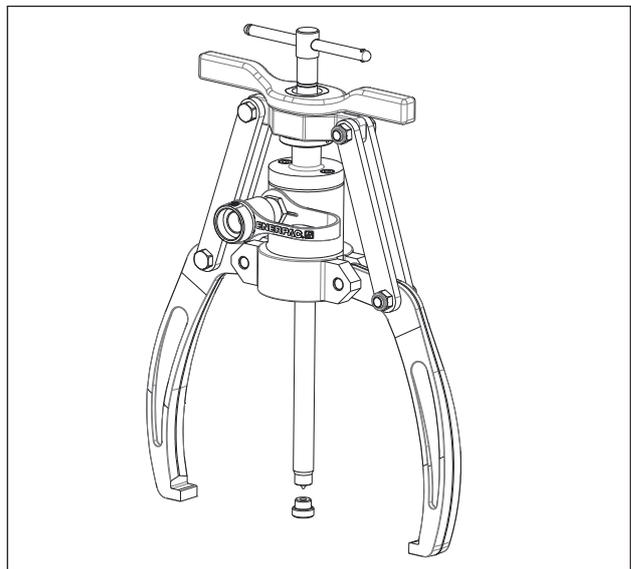
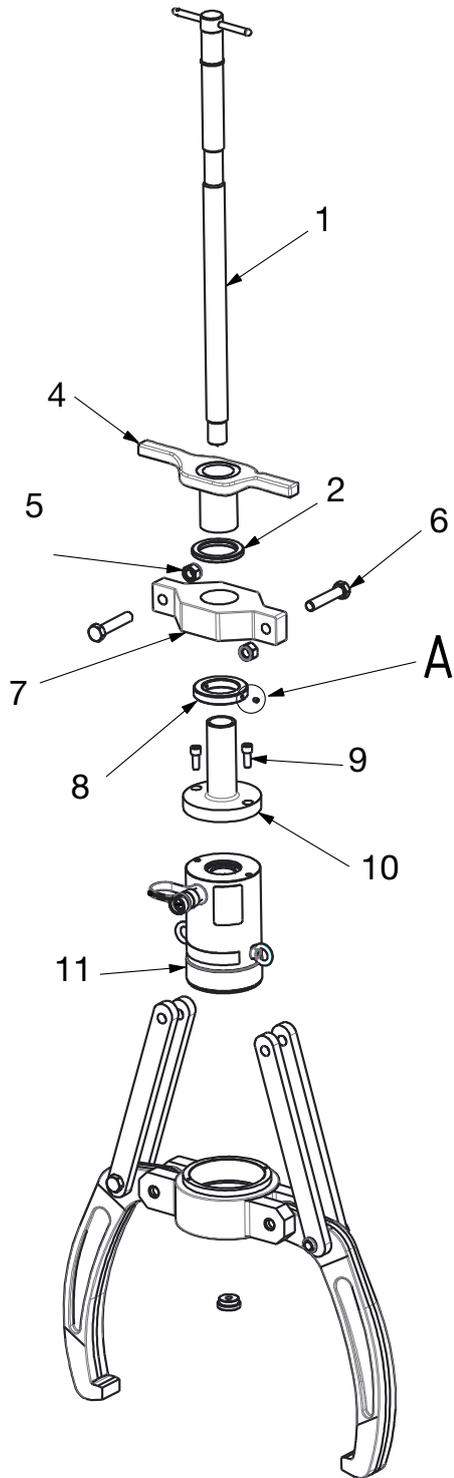


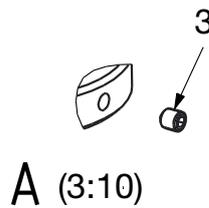
Figure 7, Puller Maximum Reach and Spread Examples (three pulleys of different sizes)

| Puller Model Number | Example A | | | | Example B | | | | Example C | | | |
|---------------------|-----------|-----|-------|-----|-----------|-----|-------|-----|-----------|-----|-------|-----|
| | A1 | | B1 | | A2 | | B2 | | A3 | | B3 | |
| | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm |
| LGH210 / LGH310 | 3.94 | 100 | 11.81 | 300 | 5.71 | 145 | 9.84 | 250 | 8.07 | 205 | 7.87 | 200 |
| LGH214 / LGH314 | 4.41 | 112 | 14.96 | 380 | 7.28 | 185 | 11.61 | 295 | 9.84 | 250 | 8.66 | 220 |
| LGH224 / LGH324 | 5.91 | 150 | 18.90 | 480 | 9.06 | 230 | 15.35 | 390 | 12.40 | 315 | 11.22 | 285 |
| LGH253 / LGH364 | 6.50 | 165 | 25.98 | 660 | 11.22 | 285 | 20.67 | 525 | 14.96 | 380 | 15.75 | 400 |

Note: See Section 11.71 for additional information.



(Assembled View)



A (3:10)

Key:

- 1. Spindle
- 2. Washer
- 3. Set screw
- 4. Handle + cap
- 5. Nut
- 6. Strap screw
- 7. Upper body
- 8. Support nut
- 9. Base screw
- 10. Threaded base
- 11. Hydraulic cylinder

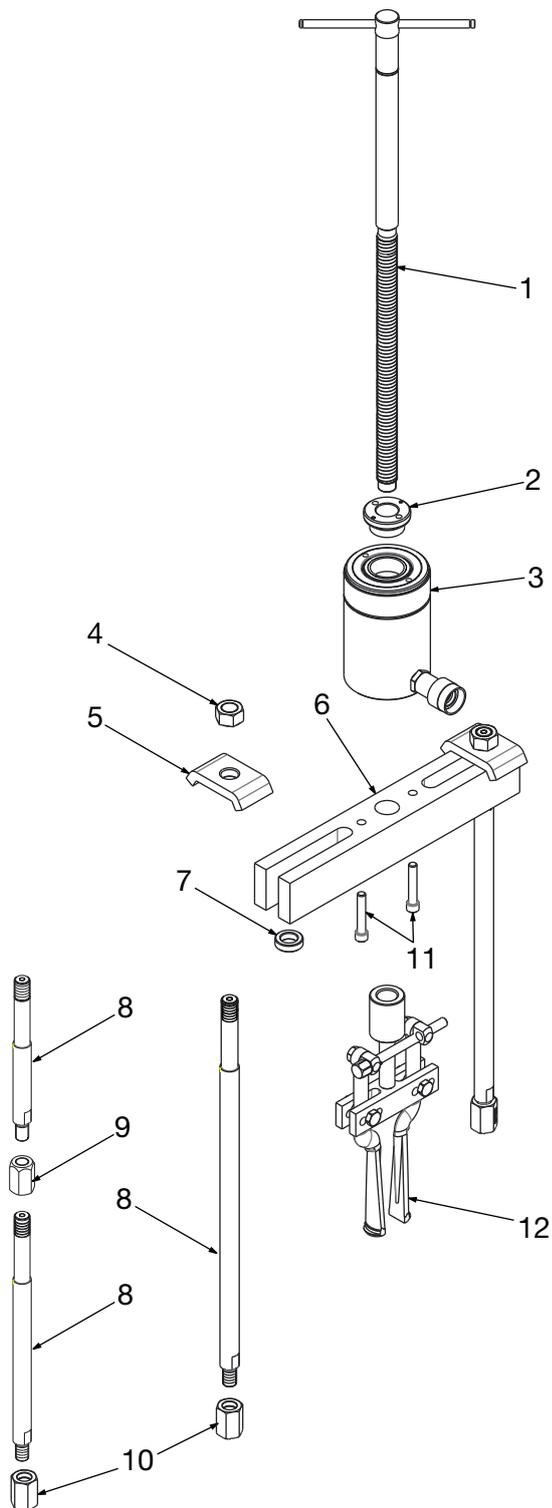
Two-jaw Configuration
(Models LGH210, LGH214, LGH224 and LGH253)

Note: This figure shows an exploded view of the two-jaw puller configuration. The figure may be used to aid in the assembly of the two- and three-jaw configurations.

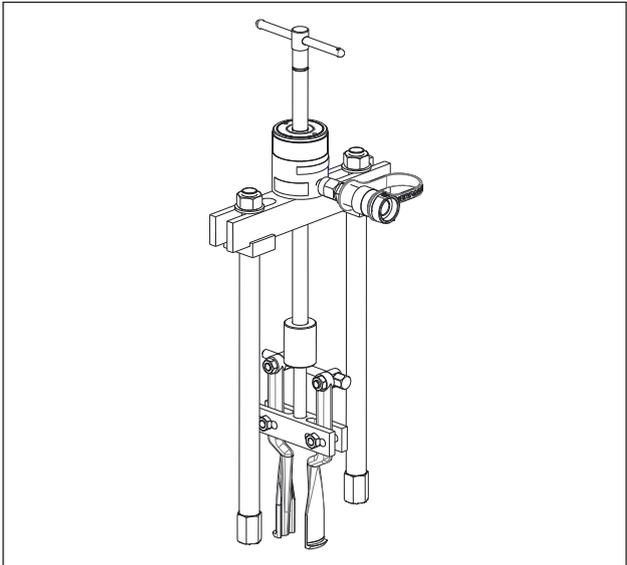
Note: Components shown in this figure are included with the LGHS-Series Lock Grip Puller Set and the LGHMS-Series Master Puller Set.

Note: Refer to the document L4257 (www.enerpac.com) to find the suitable repair part kit for each model of Hydraulic Lock Grip Puller.

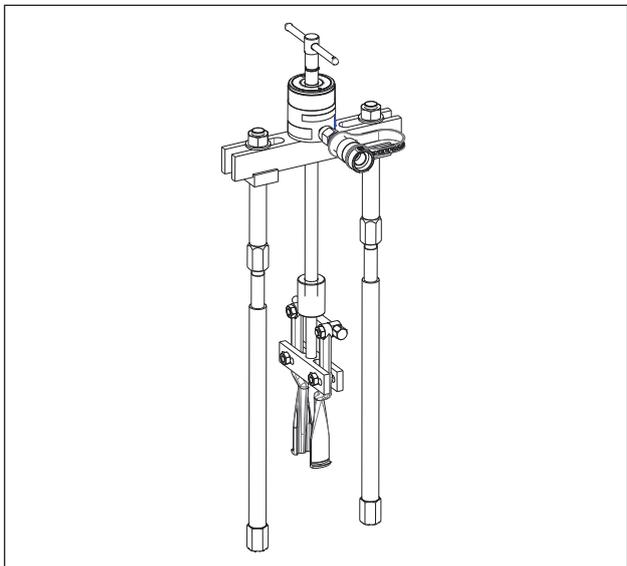
Figure 8, Setup and Assembly - Lock Grip Puller



Note: Components shown in this figure are included with the LGHMS-Series Master Puller Set.



(Assembled View)

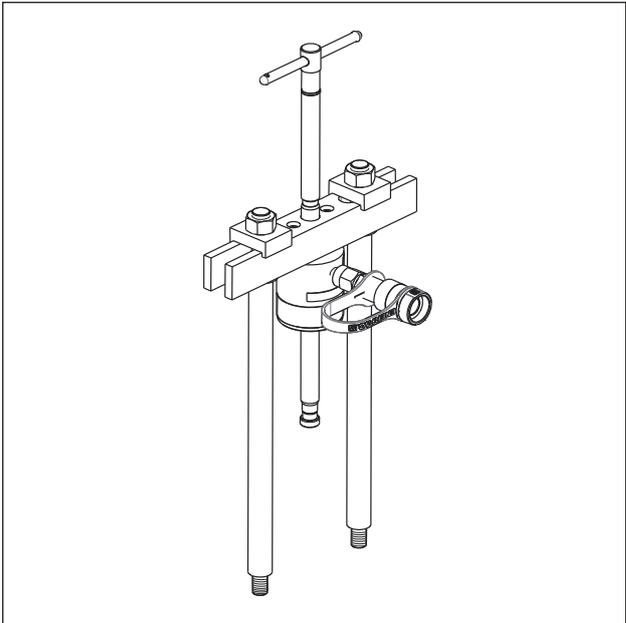
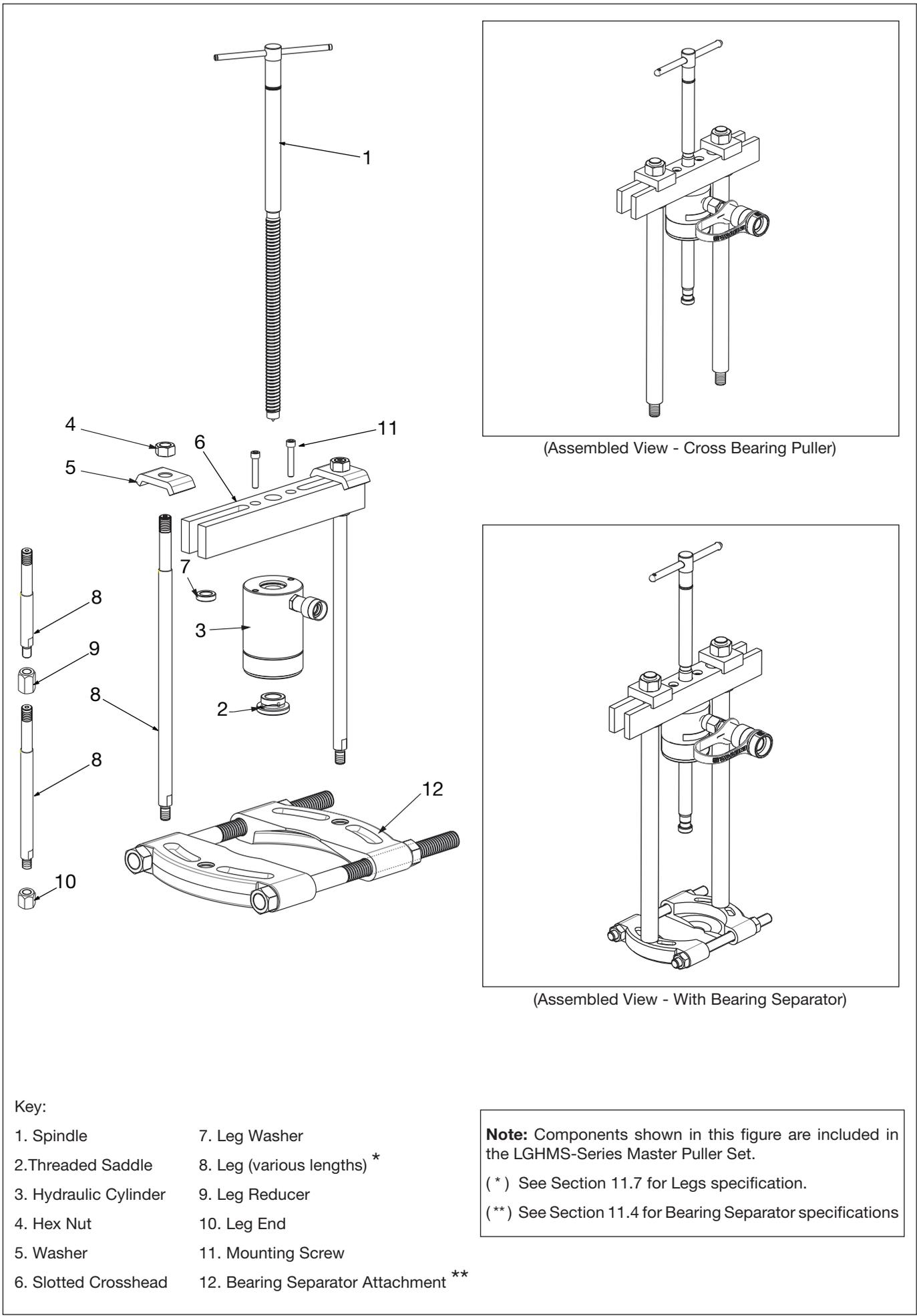


(Assembled View with extensions)

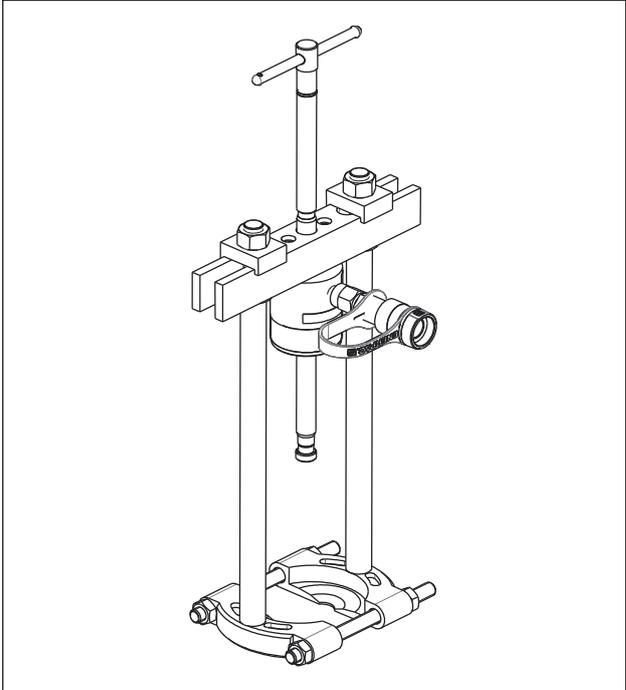
Key:

- 1. Spindle
- 2. Threaded Saddle
- 3. Hydraulic Cylinder
- 4. Hex Nut
- 5. Washer
- 6. Slotted Crosshead
- 7. Leg Washer
- 8. Leg (various lengths)
- 9. Leg Reducer
- 10. Leg End
- 11. Mounting Screw
- 12. Bearing Cup Puller

Figure 9, Setup and Assembly - Cross Bearing Puller and Bearing Cup Puller



(Assembled View - Cross Bearing Puller)



(Assembled View - With Bearing Separator)

Key:

- | | |
|-----------------------|-------------------------------------|
| 1. Spindle | 7. Leg Washer |
| 2. Threaded Saddle | 8. Leg (various lengths) * |
| 3. Hydraulic Cylinder | 9. Leg Reducer |
| 4. Hex Nut | 10. Leg End |
| 5. Washer | 11. Mounting Screw |
| 6. Slotted Crosshead | 12. Bearing Separator Attachment ** |

Note: Components shown in this figure are included in the LGHMS-Series Master Puller Set.
 (*) See Section 11.7 for Legs specification.
 (**) See Section 11.4 for Bearing Separator specifications

Figure 10, Setup and Assembly - Cross Bearing Puller and Bearing Separator

7.4 Cross Bearing Puller - Installation and Operation

The cross bearing puller may be used independently by attaching the legs directly to the workpiece to be extracted (see Figure 11). In this case, the puller legs must be threaded directly into the workpiece (refer to Section 11.7 for thread specifications). Alternatively, the cross bearing puller may be used in conjunction with the Bearing Separator Attachment (see Section 7.5) or the Bearing Cup Puller (see Section 7.6).

- Assemble puller components as described in Figure 10.
- Install the puller on the bearing, pulley or other item to be removed. Align puller legs. See Figure 11.
- If needed for your application, install the bearing separator attachment. Refer to Section 7.5.
- Read and understand the following warning statement before proceeding. Also refer to Section 10.0 of this manual for important maximum hydraulic working pressure information.

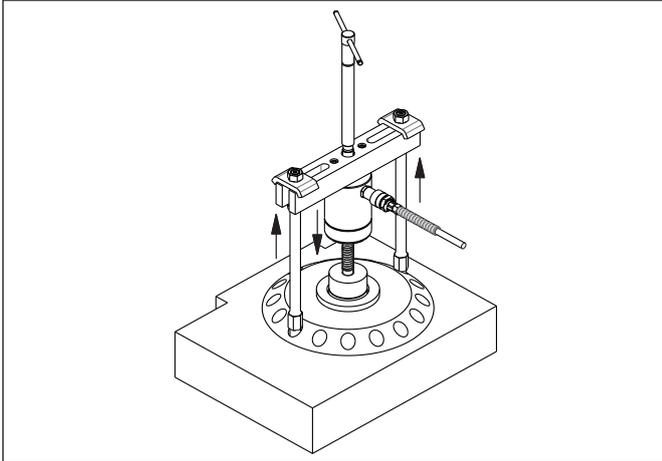


Figure 11, Cross Bearing Puller (typical)



Do not exceed the stated maximum hydraulic working pressure for the cross bearing puller model being used.

Refer to Section 10.0 of this manual for the maximum hydraulic working pressure applicable to your cross bearing puller model. Be aware that the cross bearing puller is rated at a lower maximum capacity than the hydraulic cylinder.

Overloading and catastrophic failure could occur if the stated maximum pressure limit is exceeded. Serious personal injury or death may result.

- Connect pump and hose to the puller hydraulic cylinder. Be sure that a pressure gauge is installed in the circuit.
- Gradually apply hydraulic pressure to remove the part. Continuously monitor the pressure gauge to avoid exceeding the allowable maximum working pressure for your setup.

7.5 Bearing Separator Attachment

The bearing separator attachment can be used in combination with the cross bearing puller when the application allows the Bearing Separator to be inserted under the piece to be extracted.

NOTICE Never leave a gap between the legs of the Cross Bearing Puller and the body of the workpiece, as this could result in damage to the bearing separator (see Figure 12).

The bearing separator attachment contains wedge shaped edges, allowing it to be more easily positioned behind a difficult-to-reach bearing, pulley or other shaft-mounted component. It has two halves, each containing a “flat” side and a “recessed” side.

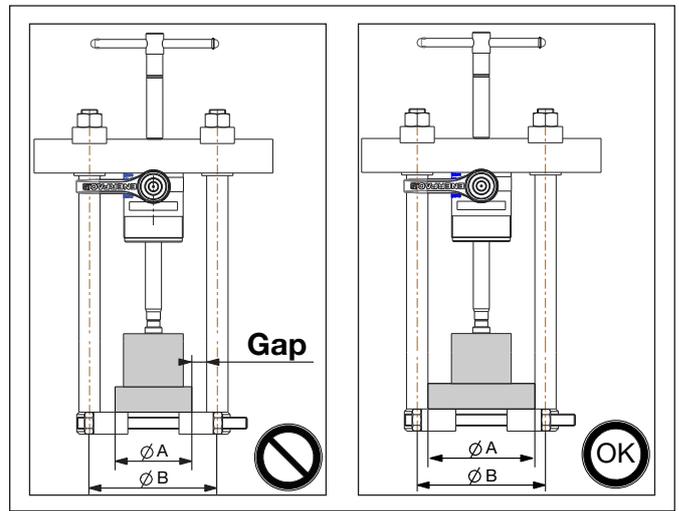


Figure 12, Bearing Separator bending prevention

Whenever possible, it is recommended that the attachment be installed in the “A” orientation, as shown in Figure 13, so that the flat side of each separator half is positioned against the part to be removed. This will help spread the load over a greater surface area, reducing the possibility of deformation.

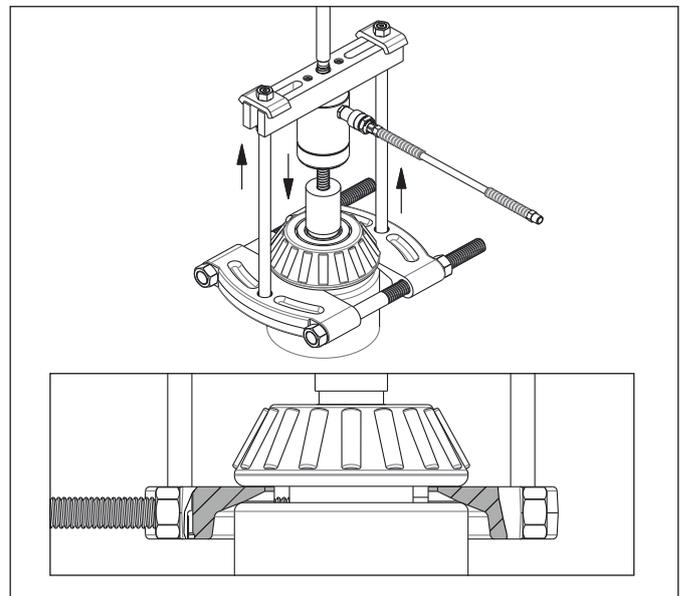


Figure 13, Bearing Separator Attachment - “A” Orientation (typical)

However, for applications where work room is especially limited, it may be necessary to begin the pulling process with the attachment installed in the “B” orientation, as shown in Figure 14. In this orientation, the recessed side of each separator half is positioned against the part to be removed.

After the part has been moved a sufficient distance on the shaft, the attachment should be reinstalled in the “A” orientation. The removal process can then be fully completed.

When using the bearing separator attachment, follow the instructions and precautions contained in Section 7.4 of this manual. Also refer to Section 10.0 for maximum rated capacities and related information.

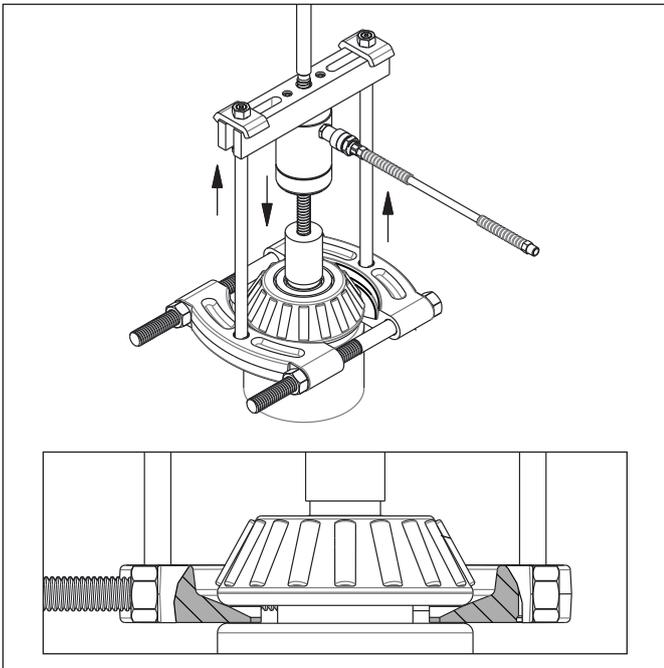


Figure 14, Bearing Separator Attachment - "B" Orientation (typical)

7.6 Bearing Cup Puller - Installation and Operation

The bearing cup puller is designed to extract the bearing placed in an internal housing. This tool must be used in combination with the Cross Bearing Puller attachment.

- Assemble puller components as shown in Figure 9.
- Install the puller on the bearing to be removed. Align puller legs and bearing cup puller jaws. See Figure 15.
- Read and understand the following warning statement before proceeding. Also refer to Section 10.0 of this manual for important maximum hydraulic working pressure information.

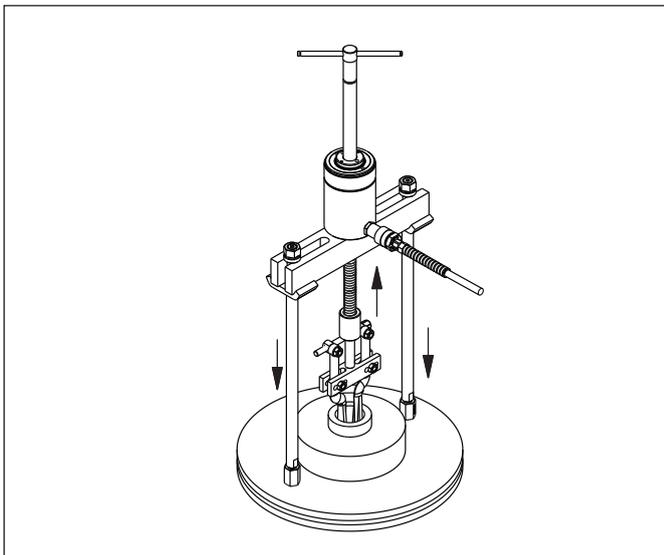


Figure 15, Cross Bearing Puller with Bearing Cup Attachment (typical)

⚠ WARNING

Do not exceed the stated maximum hydraulic working pressure for the bearing cup puller model being used.

Refer to Section 10.0 of this manual for the maximum hydraulic working pressure applicable to your bearing cup puller model. Be aware that the bearing cup puller is rated at a lower maximum capacity than the hydraulic cylinder.

Overloading and catastrophic failure could occur if the stated maximum pressure limit is exceeded. Serious personal injury or death may result.

- Connect pump and hose to the puller hydraulic cylinder. Be sure that a pressure gauge is installed in the circuit.
- Gradually apply hydraulic pressure to remove the bearing. Continuously monitor the pressure gauge to avoid exceeding the allowable maximum working pressure for your setup.

8.0 INSPECTION, MAINTENANCE & STORAGE

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

- Periodically check the hydraulic system for loose connections, leaks and other obvious problems. Replace any damaged components immediately.
- Monitor the oil temperature during operation. Do not exceed oil temperatures of 140°F [60°C].
- Keep all hydraulic components clean.
- Keep the puller in good condition. Clean and lubricate the puller's spindle and puller legs frequently, from thread to tip, to ensure good operation and long life.
- Change the hydraulic oil in your system as recommended in the pump instruction sheet. Use of Enerpac oil is strongly recommended.
- Periodically check the puller for any bent, loose, worn or deformed components. Make repairs as required before using the puller.
- Store the puller in a clean, dry and secure location. Keep stored hydraulic cylinders and hoses away from heat and direct sunlight.
- If the puller requires repairs, refer to the Enerpac website for the repair parts sheet applicable to your puller model.

NOTICE

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Center in your area.
- Refer to the document L4257 (www.enerpac.com) to find the suitable repair part kit for each model of Hydraulic Lock Grip Puller.
- Visit www.enerpac.com in order to find further information about the cylinder used in each Puller.

9.0 TROUBLESHOOTING

Refer to the troubleshooting guide (see next page) 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. As required, also refer to the troubleshooting information provided with the hydraulic pump and cylinder.

Troubleshooting Guide, LGH-Series Lock Grip Pullers

Puller Mechanical Troubleshooting

| 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. Spindle will not turn or requires excessive effort to turn. | a. Corroded threads on spindle, cylinder or threaded saddle. | If parts are seized, apply penetrating oil. Inspect threads on spindle, cylinder and threaded saddle. Dismantle and clean components as required. |
| | b. Worn or damaged threads. | Replace spindle, hydraulic cylinder and/or threaded saddle as required. Do not use puller if threads are worn or damaged. |
| | c. Spindle is bent. | Replace spindle. Do not use puller if spindle is bent. |

Hydraulic System Troubleshooting

| Symptom | Possible Cause | Solution |
|---|--------------------------------------|---|
| 1. Cylinder will not advance. | a. Pump release valve open. | Close pump release valve. |
| | b. Pump oil level is low. | Add oil to pump reservoir as required. |
| | c. Air in hydraulic system. | Remove air from hydraulic system. Refer to Section 5.5. |
| | d. Couplers not fully tightened. | Tighten couplers. |
| | e. Blocked hydraulic hose. | Repair or replace hydraulic hose. |
| | f. Pump malfunctioning. | Repair or replace pump as required. |
| | g. Cylinder seals leaking. | Repair or replace cylinder. |
| 2. Cylinder advances only part way. | a. Pump oil level is low. | Add oil to pump reservoir as required. |
| | b. Couplers not fully tightened. | Tighten couplers. |
| | c. Cylinder plunger binding. | Repair or replace cylinder. |
| 3. Cylinder advances erratically. | a. Air in hydraulic system. | Remove air from hydraulic system. Refer to Section 5.5. |
| | b. Cylinder plunger binding. | Repair or replace cylinder. |
| 4. Cylinder advances more slowly than normal. | a. Leaking connection. | Repair leaking connection. |
| | b. Couplers not fully tightened. | Tighten couplers. |
| | c. Pump malfunctioning. | Repair or replace pump as required. |
| 5. Cylinder advances, but will not hold. | a. Cylinder seals leaking. | Repair or replace cylinder. |
| | b. Leaking or loose connection. | Repair leaking connection. |
| | c. Pump malfunction. | Repair or replace pump. |
| 6. Cylinder leaks oil. | a. Leaking or loose connection. | Repair leaking connection. |
| | b. Worn or damaged cylinder plunger. | Repair or replace cylinder. |
| | c. Internal leakage. | Repair or replace cylinder. |
| 7. Cylinder will not retract or retracts more slowly than normal. | a. Pump release valve closed. | Open pump release valve. |
| | b. Coupler not fully tightened. | Tighten coupler. |
| | c. Pump reservoir is overfilled. | Drain oil from pump reservoir as required. |
| | d. Blocked hydraulic hose. | Repair or replace hydraulic hose. |
| | e. Internal cylinder damage. | Repair or replace cylinder. |

10.0 CAPACITIES

10.1 Maximum Rated Capacity Information-Pullers

| Puller Model No. | Hydraulic Cylinder Model No. | Quantity of Jaws Installed | Puller Maximum Rated Capacity | | Cylinder Maximum Rated Capacity | | Maximum allowable hydraulic working pressure when cylinder is installed on puller: | |
|------------------|------------------------------|----------------------------|-------------------------------|-------|---------------------------------|-------|--|-----|
| | | | US Tons | kN | US Tons | kN | psi | bar |
| LGH210 | RWH101B100 | 2 | 10.3 | 91.7 | 10.3 | 91.7 | 10.150 | 700 |
| LGH214 | RWH121 | 2 | 14.0 | 124.6 | 14.0 | 124.6 | | |
| LGH224 | RCH202 | 2 | 24.2 | 215.0 | 24.2 | 215.0 | | |
| LGH253 | RCH513 | 2 | 52.5 | 467.3 | 52.5 | 467.3 | | |
| LGH310 | RWH101B100 | 3 | 10.3 | 91.7 | 10.3 | 91.7 | | |
| LGH314 | RWH121 | 3 | 14.0 | 124.6 | 14.0 | 124.6 | | |
| LGH324 | RCH202 | 3 | 24.2 | 215.0 | 24.2 | 215.0 | | |
| LGH364 | RCH603 | 3 | 64.7 | 576.0 | 64.7 | 576.0 | | |

10.2 Maximum Rated Capacity Information - Puller Accessories

| Accessory | Accessory Model Number No. | Hydraulic Cylinder Model No. | Accessory Maximum Rated Capacity | | Cylinder Maximum Rated Capacity | | Maximum allowable hydraulic working pressure when cylinder is used with accessory: | |
|-------------------------------|----------------------------|------------------------------|----------------------------------|-----|---------------------------------|-------|--|-----|
| | | | US Tons | kN | US Tons | kN | psi | bar |
| Cross Bearing Puller Set | BHP112 | RWH101B100 | 7.0 | 75 | 10.3 | 91.7 | 6898 | 476 |
| | BHP172 | RWH121 | 7.0 | 75 | 14.0 | 124.6 | 5076 | 350 |
| | BHP272 | RCH202 | 12.0 | 107 | 24.0 | 215.0 | 5043 | 348 |
| | BHP672 | RCH603 | 25.0 | 222 | 64.7 | 576.0 | 3922 | 270 |
| Bearing Separator Attachment | BHP181 | RWH101B100 | 7.0 | 75 | 10.3 | 91.7 | 6898 | 476 |
| | BHP282 | RWH121 | 12.0 | 107 | 14.0 | 124.6 | 8702 | 600 |
| | BHP292 | RCH202 | 12.0 | 107 | 24.2 | 215.0 | 5043 | 348 |
| | BHP682 | RCH603 | 25.0 | 222 | 64.7 | 576.0 | 3922 | 270 |
| Bearing Cup Puller Attachment | BHP180 | RWH101B100 | 7.0 | 75 | 10.3 | 91.7 | 6898 | 476 |
| | BHP190 | RWH121 | 7.0 | 75 | 14.0 | 124.6 | 5076 | 350 |
| | BHP280 | RCH202 | 12.0 | 107 | 24.2 | 215.0 | 5043 | 348 |
| | BHP580 | RCH603 | 25.0 | 222 | 64.7 | 576.0 | 3922 | 270 |



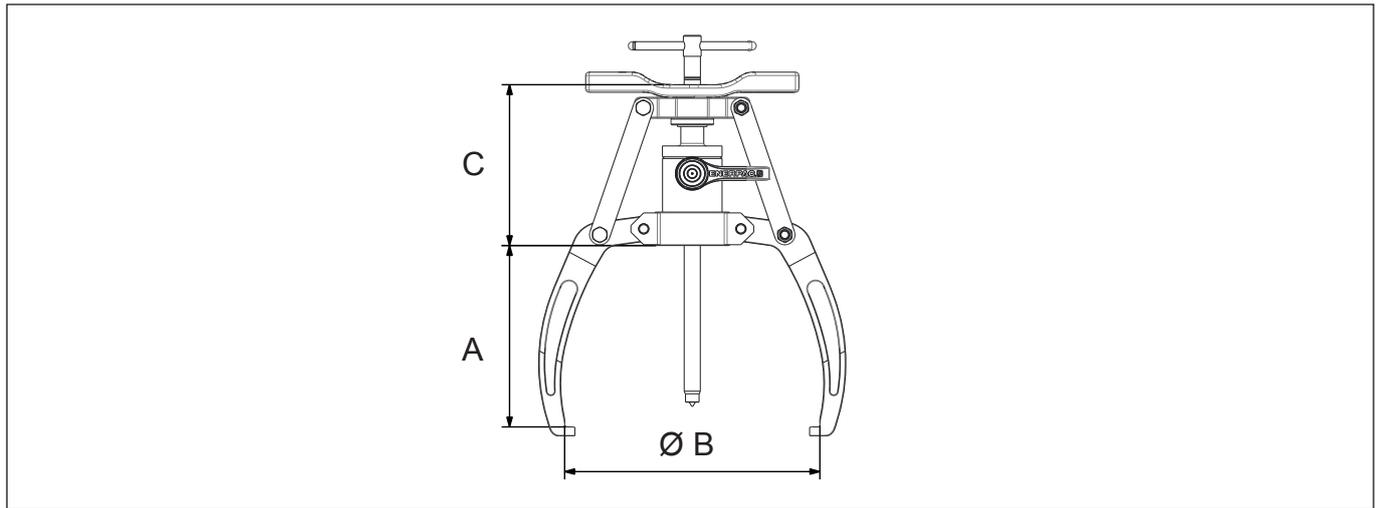
Do not exceed the stated maximum hydraulic working pressure for the puller or accessory being used. Refer to the information contained in Sections 10.1 and 10.2.

Overloading and catastrophic failure could occur if the stated maximum pressure is exceeded. Serious personal injury or death may result.

Be aware that in some instances, the rated maximum capacity of the puller or accessory may be LESS than the rated maximum capacity of the cylinder, and that hydraulic pressure must be reduced accordingly.

11.0 PRODUCT DATA

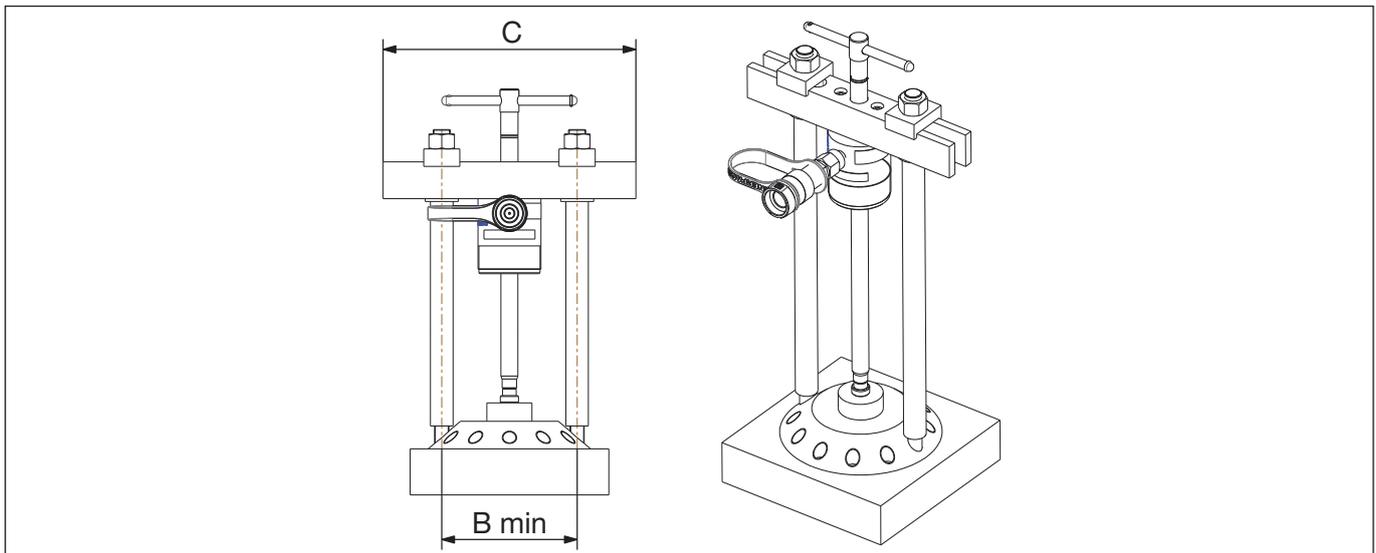
11.1 Specifications and Dimensions - Puller Reach, Spread and Weights



| Puller Model No. | Capacity | | A max. | | C | | Ø B max. | | Ø B min. | | *  | |
|------------------|----------|-------|--------|-----|-------|-----|----------|-----|----------|-----|---|-------|
| | US Tons | KN | in | mm | in | mm | in | mm | in | mm | lb | Kg |
| LGH210 | 10.3 | 91.7 | 8.46 | 215 | 7.56 | 192 | 11.81 | 300 | 3.31 | 84 | 22.66 | 10.3 |
| LGH214 | 14.0 | 124.6 | 10.24 | 260 | 7.32 | 186 | 14.96 | 380 | 4.92 | 125 | 31.24 | 14.2 |
| LGH224 | 24.2 | 215.0 | 13.23 | 336 | 12.80 | 325 | 18.90 | 480 | 6.50 | 165 | 82.28 | 37.4 |
| LGH253 | 52.5 | 467.3 | 16.06 | 408 | 18.62 | 473 | 25.98 | 660 | 9.06 | 230 | 243.76 | 110.8 |
| LGH310 | 10.3 | 91.7 | 8.46 | 215 | 7.56 | 192 | 11.81 | 300 | 3.31 | 84 | 27.94 | 12.7 |
| LGH314 | 14.0 | 124.6 | 10.24 | 260 | 7.32 | 186 | 14.96 | 380 | 4.92 | 125 | 40.04 | 18.2 |
| LGH324 | 24.2 | 215.0 | 13.23 | 336 | 12.80 | 325 | 18.90 | 480 | 6.50 | 165 | 104.06 | 47.3 |
| LGH364 | 64.7 | 576.0 | 16.06 | 408 | 18.62 | 473 | 25.98 | 660 | 9.06 | 230 | 306.90 | 139.5 |

* Approximate weight of assembled puller, including body, spindle, jaws and hydraulic cylinder.

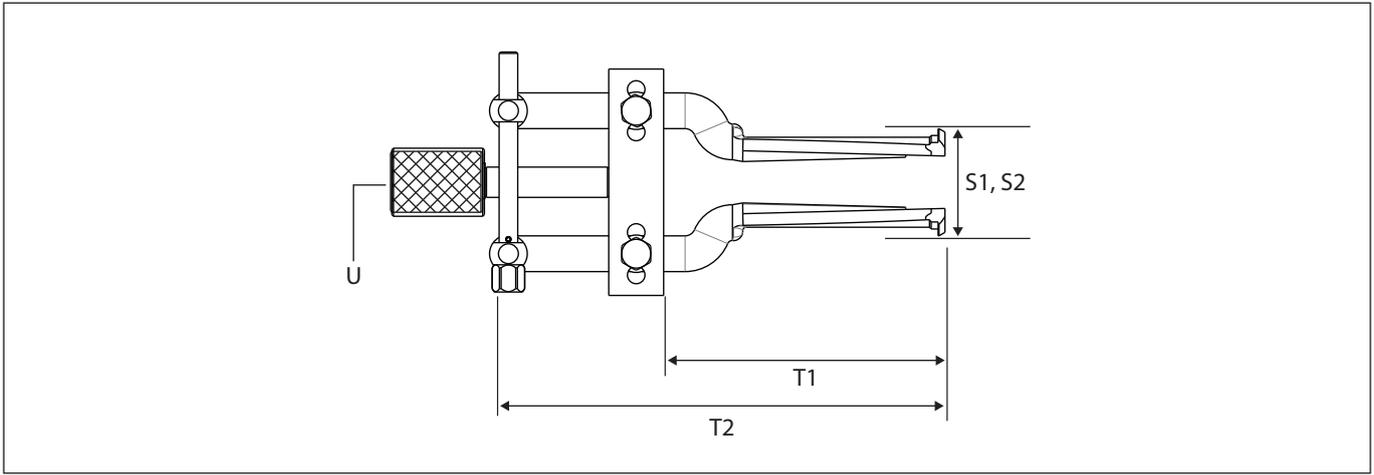
11.2 Specifications and Dimensions - Cross Bearing Puller Reach and Weights



| Cross Bearing Puller Model No. | Master Puller Set Model No. | B min. | | C | | *  | |
|--------------------------------|-----------------------------|--------|-----|-------|-----|---|-----|
| | | in | mm | in | mm | lb | Kg |
| BHP112 | LGHMS310 | 4.53 | 115 | 11.02 | 280 | 4.40 | 2 |
| BHP172 | LGHMS314 | 4.53 | 115 | 11.02 | 280 | 4.62 | 2.1 |
| BHP272 | LGHMS324 | 5.51 | 140 | 14.57 | 370 | 5.28 | 2.4 |
| BHP672 | LGHMS364 | 8.66 | 220 | 24.21 | 615 | 14.08 | 6.4 |

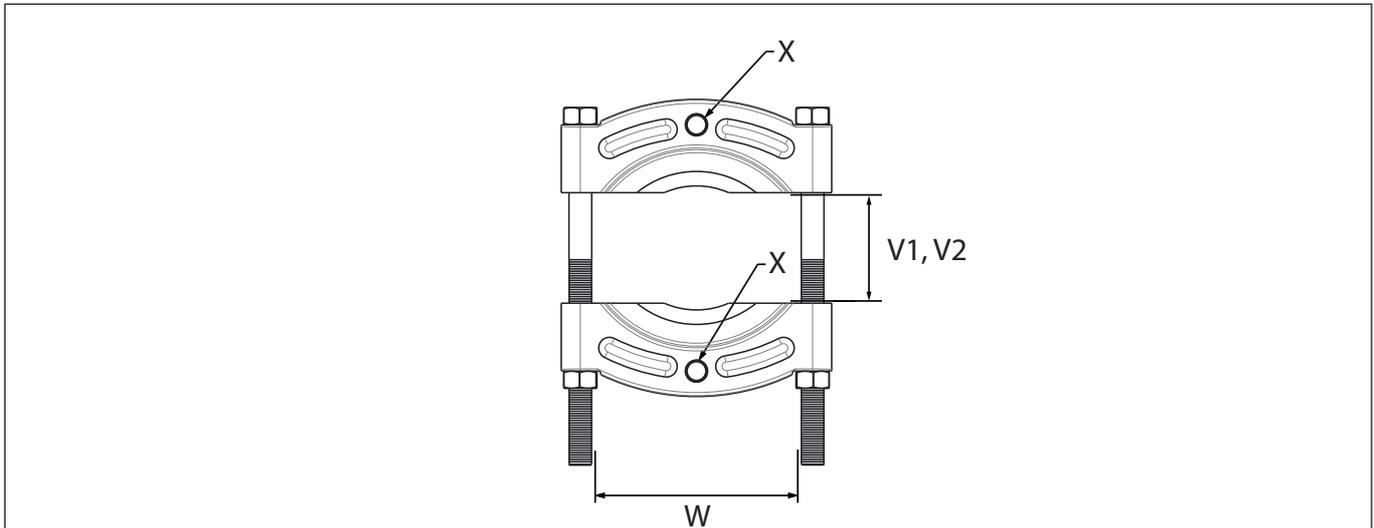
Note: See Section 11.7 for Legs specification.

11.3 Specifications and Dimensions - Bearing Cup Puller Attachment



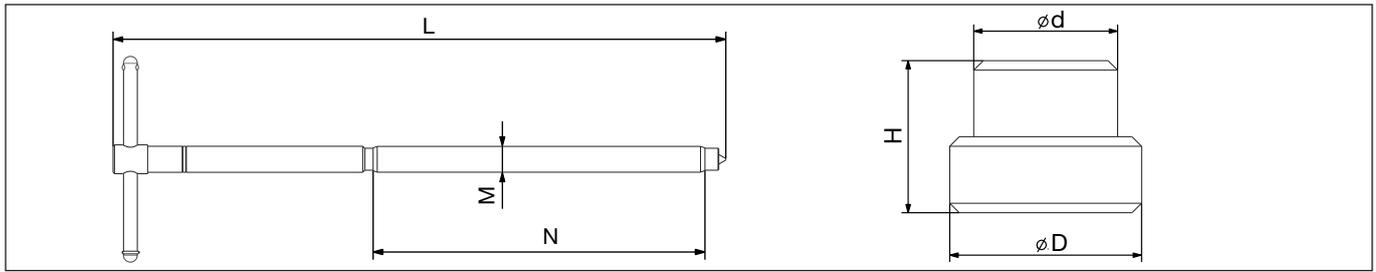
| Bearing Cup Puller Attachment Model No. | Master Puller Set Model No. | S1 min. | | S2 max. | | T1 | | T2 | | U | Weight | |
|---|-----------------------------|---------|----|---------|-----|------|-----|-------|-----|-----------------|--------|-----|
| | | in | mm | in | mm | in | mm | in | mm | | lb | Kg |
| BHP180 | LGHMS310 | 1.57 | 40 | 5.71 | 145 | 5.31 | 135 | 9.29 | 236 | 3/4" UNF 16H | 4.40 | 2 |
| BHP190 | LGHMS314 | 1.57 | 40 | 5.71 | 145 | 6.46 | 164 | 10.43 | 265 | 3/4" UNF 16H | 4.62 | 2.1 |
| BHP280 | LGHMS324 | 1.57 | 40 | 5.71 | 145 | 6.46 | 164 | 10.43 | 265 | 1" UNC 8H | 5.28 | 2.4 |
| BHP580 | LGHMS364 | 2.36 | 60 | 9.45 | 240 | 5.91 | 150 | 12.20 | 310 | 1-5/8" UNC 5.5H | 14.08 | 6.4 |

11.4 Specifications and Dimensions - Bearing Separator Attachment



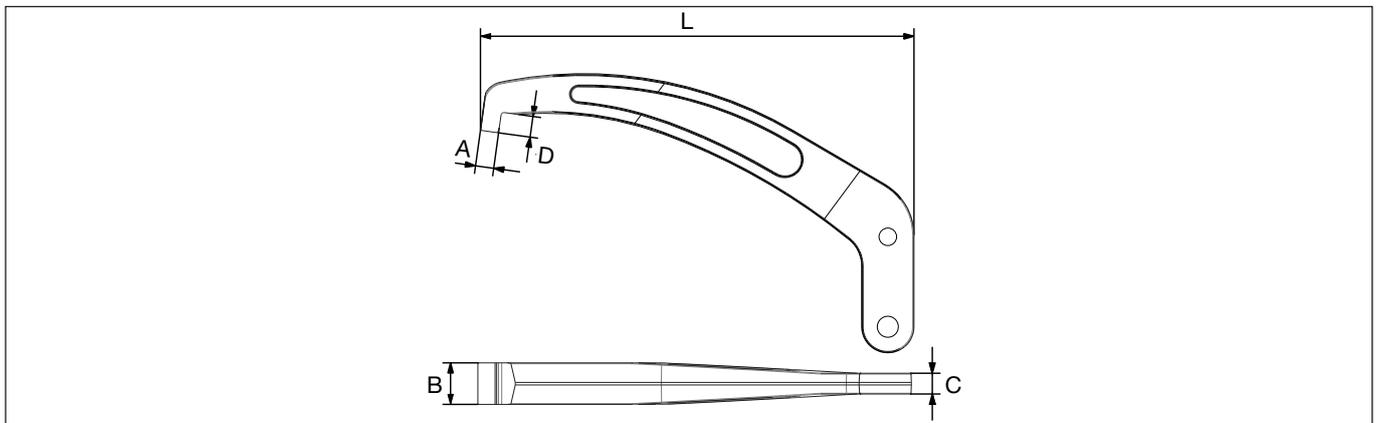
| Bearing Separator Attachment Model No. | Master Puller Set Model No. | V1 min. | | V2 max. | | W | | X | Weight | |
|--|-----------------------------|---------|----|---------|-----|-------|-----|----------------|--------|------|
| | | in | mm | in | mm | in | mm | | lb | Kg |
| BHP181 | LGHMS310 | 0.39 | 10 | 4.33 | 110 | 4.33 | 110 | 5/8" UNF 18H | 6.16 | 2.8 |
| BHP282 | LGHMS314 | 0.47 | 12 | 5.28 | 134 | 6.14 | 156 | 5/8" UNF 18H | 12.54 | 5.7 |
| BHP292 | LGHMS324 | 0.51 | 13 | 8.27 | 210 | 7.17 | 182 | 5/8" UNF 18H | 27.50 | 12.5 |
| BHP682 | LGHMS364 | 0.79 | 20 | 11.81 | 300 | 11.81 | 300 | 1-1/4" UNF 12H | 95.70 | 43.5 |

11.5 Specifications and Dimensions - Spindle and Point Protector



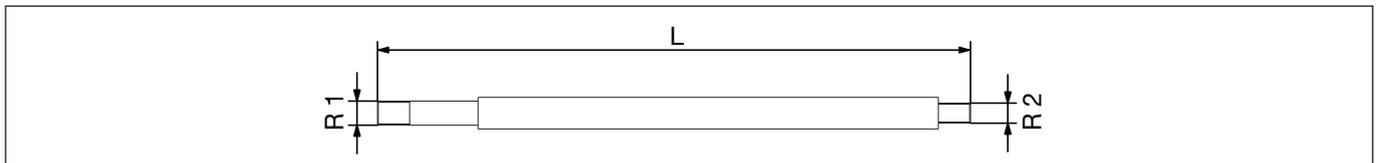
| Grip Puller Model No. | L | | N | | M | d | | D | | H | |
|-----------------------|-------|-----|-------|-----|-----------------|------|----|------|----|------|------|
| | in | mm | in | mm | | in | mm | in | mm | in | mm |
| LGH210 / LGH310 | 17.44 | 443 | 9.45 | 240 | 3/4" UNF 16h | 0.59 | 15 | 0.79 | 20 | 0.63 | 16 |
| LGH214 / LGH314 | 19.41 | 493 | 10.04 | 255 | 3/4" UNF 16h | 0.83 | 21 | 1.50 | 38 | 0.65 | 16.5 |
| LGH224 / LGH324 | 27.24 | 692 | 16.81 | 427 | 1" UNC 8h | 1.26 | 32 | 1.57 | 40 | 0.67 | 17 |
| LGH253 / LGH364 | 35.71 | 907 | 19.69 | 500 | 1-5/8" UNC 5.5h | 1.50 | 38 | 1.73 | 44 | 0.71 | 18 |

11.6 Specifications and Dimensions - Puller Jaws



| Puller Model No. | D | | B | | C | | A | | L | |
|------------------|------|----|------|----|------|----|------|----|-------|-----|
| | in | mm | in | mm | in | mm | in | mm | in | mm |
| LGH210 / LGH310 | 0.47 | 12 | 0.94 | 24 | 0.47 | 12 | 0.43 | 11 | 9.80 | 249 |
| LGH214 / LGH314 | 0.55 | 14 | 1.18 | 30 | 0.63 | 16 | 0.67 | 17 | 11.81 | 300 |
| LGH224 / LGH324 | 0.75 | 19 | 1.77 | 45 | 0.79 | 20 | 0.91 | 23 | 15.39 | 391 |
| LGH253 / LGH364 | 1.02 | 26 | 2.17 | 55 | 1.34 | 34 | 1.38 | 35 | 19.37 | 492 |

11.7 Specifications and Dimensions - Legs



| Master Puller Set Model No. | Leg Model No. | L | | R1 | R2 |
|-----------------------------|---------------|-------|--------|------------------|------------------|
| | | in | mm | | |
| LGHMS310 & LGHMS314 | HP1136 | 8.23 | 209.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| | HP1137 | 18.11 | 460.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| LGHMS324 | HP2006 | 14.21 | 361.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| | HP2007 | 21.30 | 541.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| | HP2008 | 27.20 | 691.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| | HP2012 | 9.29 | 236.0 | 3/4"-16 UNF | 5/8"-18 UNF |
| LGHMS364 | HP5007 | 32.30 | 820.5 | 1 1/4"-12 UNF-2A | 1 1/4"-12 UNF-2A |
| | HP5008 | 42.34 | 1075.5 | 1 1/4"-12 UNF-2A | 1 1/4"-12 UNF-2A |

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