ENERPAC

Operation and Maintenance Manual

Enerpac RP70A

Hydraulic Rail Puller/Stressor

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Pull: 70 Tons

Stretch: 45 Tons

⚠ To reduce the risk of injury, user must read and understand this document before use.

ABOUT US

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products, portable machining, on-site services and solutions for precise positioning of heavy loads. As a leading innovator with a 110-year legacy, Enerpac has helped move and maintain some of the largest structures on earth. When safety and precision matters, elite professionals in industries such as aerospace, infrastructure, manufacturing, mining, oil & gas and power generation rely on Enerpac for quality tools, services and solutions. For additional information, visit www.enerpac.com.

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WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE

AVAILABLE LANGUAGES

L4578 is available in the following languages, visit www.enerpac.com for a copy.

- Weitere Sprachen finden Sie unter www.enerpac.com.
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Contents

1. Safety

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 that any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

Save these instructions for future use.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for information about Enerpac Hydraulic Safety Courses.

This manual follows a system of safety alert symbols, signals, 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 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 DANGER, WARNING, CAUTION, and NOTICE.

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

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 related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

1.1 Safety Precautions

WARNING

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

- Always wear protective head-wear, ear protectors, footwear and gloves (at a minimum rigger type gloves) suitable for safe operation of the tool. The protective clothing must not interfere with safe operation of the tool or restrict the ability to communicate with co-workers.
- Be sure your workplace is safe. Follow the instructions in your workplace's standard operating procedures and be sure to observe all communicated safety precautions.
- Read and completely understand the safety precautions and instructions in this manual before operating the system or preparing it for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- Ensure all hydraulic components are rated to a safe working pressure.
- Never set the relief valve to a higher pressure than the maximum rated pressure of the system. Higher settings may result in equipment damage and/or personal injury.
- Do not overload equipment. Never attempt to move a load weighing more than the capacity of the system. Overloading causes equipment failure and possible personal injury.
- Be sure setup is stable before moving load.
- Always perform a visual inspection of the system before placing it into operation. If any problems are found, do not use the tool. Have the tool repaired and tested by an Enerpac Authorized Service Center before it is returned to service.
- Never use a tool that is leaking oil. Do not use the equipment if is damaged, altered or in need of repair.
- Be sure the operator has completed safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the controls and the proper use of the tool.
- The operator must be of at least the minimum age required by applicable local regulations, laws and the facility standard operating procedures.
- Never attempt to relieve hydraulic pressure by loosening a coupler.
- Never use force to unseat a coupler check ball that is under hydraulic pressure.
- Take every precaution to prevent oil leaks from occurring. High pressure oil leaks can penetrate the skin, resulting in serious injury.
- Do not over-tighten connections; connections need only be secure and leak free. Over tightening can cause premature thread failure.

- Loose or cross threaded fittings can be potentially dangerous if pressurized. Never stand directly in line with any hydraulic connection while pressurizing.
- Never strike the tool while it is pressurized or moving load. Components under tension may become dislodged, allowing them to become dangerous projectiles. Uncontrolled release of pressurized hydraulic oil could also occur.
- Avoid striking the tool at any time, even when it is not pressurized or moving load. Striking the tool could cause permanent damage to system components and may affect its functioning.
- Be certain that no persons are working on or near any tool before moving of the load begins. Alert all personnel in advance that the procedure is about to occur.
- Always maintain communication with the operator during procedure to avoid accidents. Use hand signals, two- way radios or other appropriate forms of communication (as required by applicable laws and regulations) if the load is not visible to the operator.
- Operate RP70A as required to ensure that the load is moved evenly and at a controlled rate.
- Closely watch the load at all times during operation. Stop work immediately if the load becomes unstable or appears to be moving unsteadily.
- Immediately replace worn or damaged parts. Use only genuine Enerpac parts from approved distributors or service centers. Standard grade parts will break causing personal injury and property damage. ENERPAC parts are designed to fit properly and withstand high loads.
- To minimize risk of personal injury keep hands and feet away from the tool and workpiece during operation.

⚠ CAUTION

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

- Ensure components are protected from external sources of damage, such as moving machine parts, sharp edges, weld spatter, corrosive chemicals and excessive heat or flame.
- 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 hydraulic equipment to temperatures of 150˚F [65˚C] or higher. Protect all hydraulic equipment from weld spatter.
- To prevent damage to pump electric motor, check specifications. Use of incorrect power source will damage the motor.
- Lubricate tools as directed in this manual prior to operation. Use only approved lubricants of high quality, following the lubricant manufacturers instructions
- Protect hoses and cylinders from weld spatter.
- Avoid damaging the hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe backpressure. 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.
- Do not lift hydraulic equipment by the hose or couplers. Use the lifting handles provided on cylinders and clamp assemblies.
- Do not pull on a hose that is connected. If pulling forces are exerted on a hydraulic coupling the hose and coupling interface will weaken which may result in the hose bursting out of the coupling.
- Always lift a hose by the hose itself, whilst supporting the coupling.
- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.
- During assembly the hose must be supported by necessary use bend guides to prevent twisting of the hose.
- Change worn or damaged hoses immediately.
- Do not use dirty or corroded couplings.

NOTICE

Failure to observe and comply with the following precautions could result in property damage and/or void the product warranty.

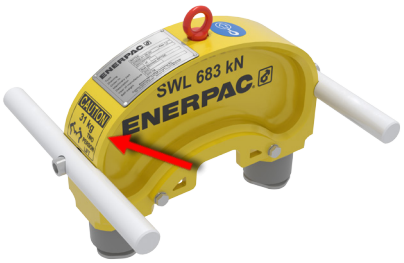
- In severe service conditions, be aware that the RP70A must be inspected, cleaned and lubricated more frequently than normal.
- If oil leakage is present, replace seals as required before placing the tool back into service.
- If the RP70A is dropped from a significant height, have the tool inspected and checked for proper operation before placing it back into service.
- While moving the hoses, prevent the couplings being dragged over the ground:
- Always follow the inspection and maintenance instructions contained in this manual. Perform maintenance and inspection activities at the specified time intervals.
- 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.

2. Transport, Loading and Unloading of the System

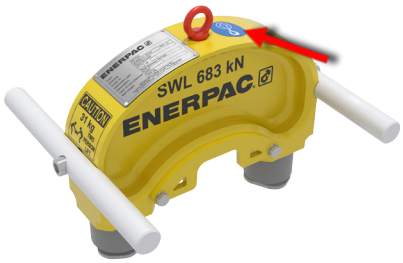
- Loading and unloading has to be performed by properly trained operators.
- Only use lifting and hoisting equipment with suitable capacity for the loads in question.
- Lift loads as described in the user manual (connection points for lifting hooks) and observe the professional standards.
- Only use suitable containers with adequate load-bearing capacity for transport purposes.
- Disconnect all hydraulic connections when the System has to be moved, even if it is for only a short distance.
- To avoid damage during transport use rubber pads and plastic for packaging.
- Containers may be used for transport since they provide rigid protection against and avoid weather influences. Make sure that all parts are secured against sliding around.
- A transport frame is available as an option.

Figure 1: Transport Frame

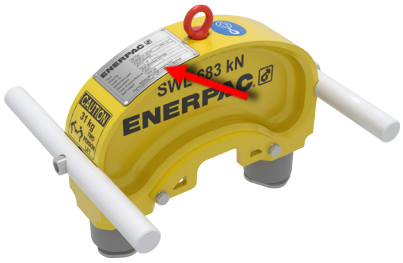
3. Texts and Signs on the System



Clamp: Caution, 31 kg, Two persons lift

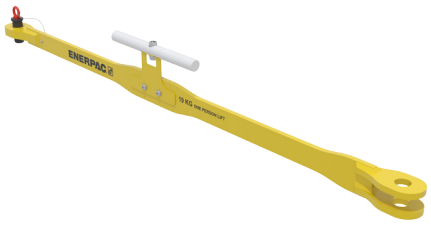


Clamp: Hoisting point



Clamp: Identification plate

Cylinder: 21 kg, One person lift



Extension strip:19 kg, One person lift

Swing arm: 16 kg, One person lift

4. Hoses Connection

NOTICE

Wipe off couplers before use to prevent contamination from getting into the system.

Hydraulic couplers can be connected and disconnected without tools and without much leakage. These couplers come with a safety lock to add an extra layer of safety by eliminating any risks of accidental disconnections.

To connect the couplers, push down the safety lock and push both couplers together till they are completely mated. The safety lock will return to its original position by spring force and seal the connection.

NOTICE

To disconnect the couplers, push down the safety lock and pull the couplers apart.

NOTICE

Hydraulic pressure can sometimes become trapped within a hydraulic hose. A common indication of trapped pressure is when mating couplers will not engage or are unusually difficult to engage. Do not apply wrenches or pliers. If couplings will not fully turn, then release system pressure at the external power source that may have been built up.

⚠ WARNING

Careless handling of hydraulics can cause serious injuries.

5. Features & Components

5.1 Feature Diagram

1. Connector pins (6 items)
2. Hydraulic coupler (4 items)
3. Cylinder (2 items)
4. Coupler (2 items)
5. Rail (1 item)
6. Extension strip (2 items)
7. Clamp (2 items)
8. Rail grip (4 items)
9. Swing arm (4 items)

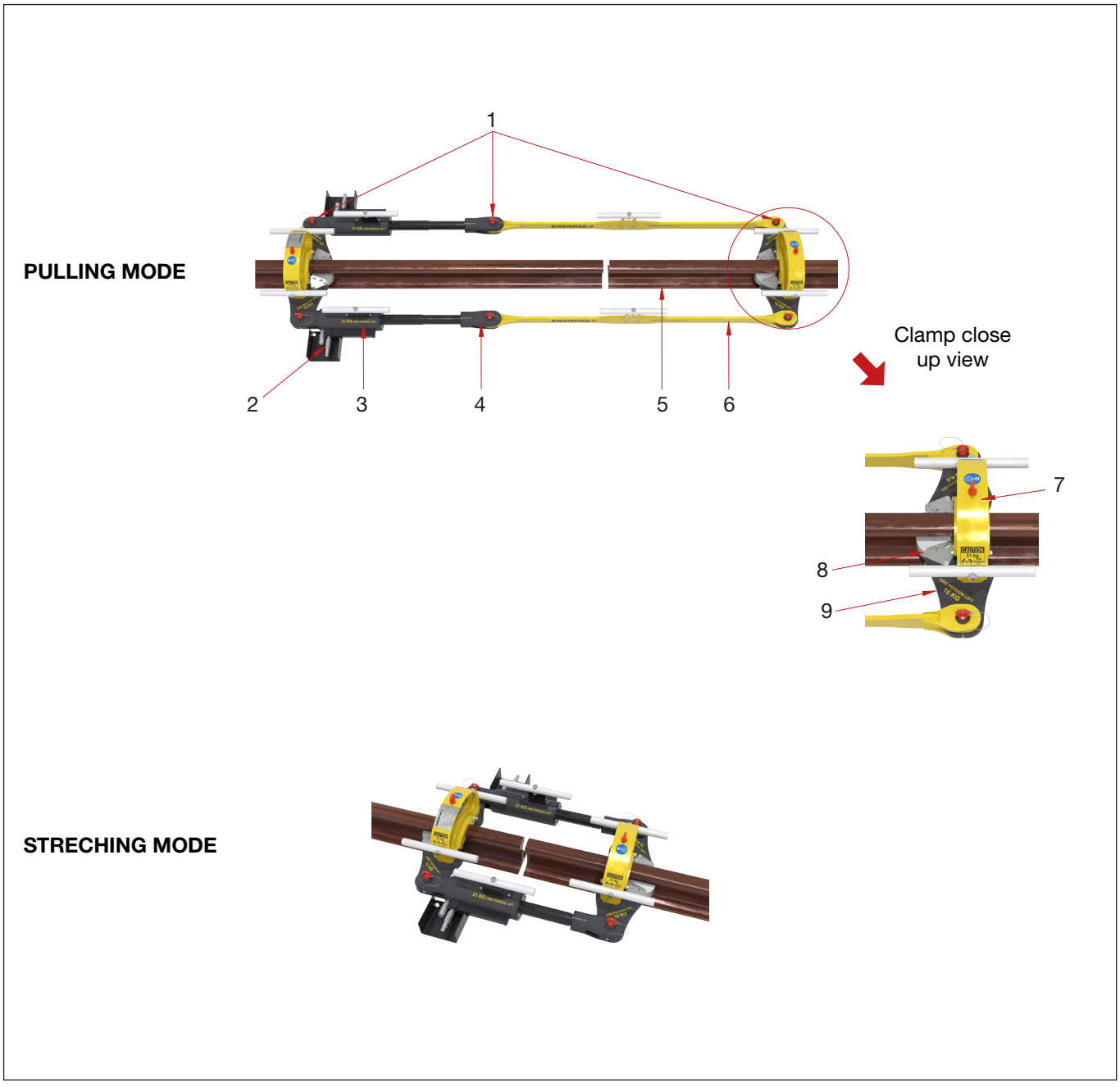


Figure 2: Major Features and Components of RP70A

The rail grips (Figure 2, item 8) are mounted on swing arms (Figure 2, item 9), which are attached to the clamps in a flexible way.

NOTICE

The cylinders are operated by a powerpack, which is not part of the delivery.

5.2 General Description

The main principles of the operating modes are illustrated below in a schematical way.

Blue arrows show the direction of the exerted forces.

Purple arrows show the movement direction of the rods of the cylinders.

The system has two operating modes:

Pulling Mode

In this operating mode two rail-ends are pulled towards each other.

- The hydraulic cylinders pull the extension strips.
- The extension strips are connected to the clamp of the opposite side.
- Rail grips clamp both clamps to the rail.

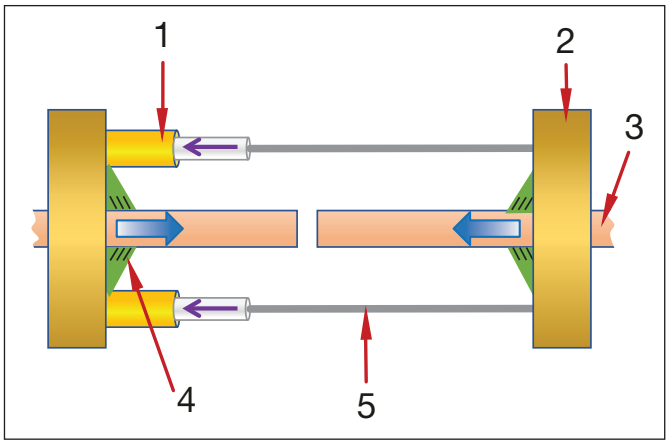


Figure 3: Pulling Mode Top View

1. Hydraulic cylinder
2. Clamp
3. Rail
4. Rail grip
5. Rod

Streching Mode

In this operating mode a rail is stretched.

- The pistons of the hydraulic cylinders push directly against the clamp at the opposite side. No use is made of extension strips.
- Rail grips clamp both clamps to the rail.

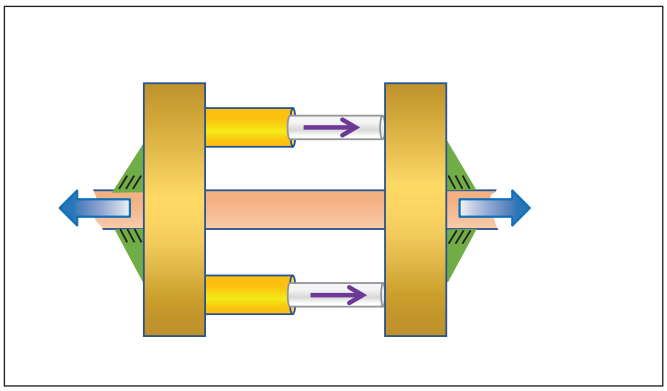


Figure 4: Streching Mode Top View

⚠ WARNING

The System is intended for stressing rails. Do not use the System for any other purpose.

⚠ WARNING

No alterations may be made to the System. Only use the System as it was delivered. Using the System for other purposes than the intended use may cause hazards to personnel and may cause damage to the equipment.

6. Technical Product Data

6.1 RP70A Capabilities

TEMPERATURE		
Operating temperature	Min	-10°C
	Max	+65°C
Temperature of the hydraulic oil	Min	-20°C
	Max	+70°C
Storage temperature	Min	-25°C
	Max	+60°C

⚠ CAUTION

There is a risk of ice accretion at temperatures below 0°C. If ice has accreted on machine components, they cannot be used since they may lock up.

Consult Enerpac if you want to apply the system by other temperatures.

HYDRAULIC FEATURES		
Powerpack requirements	Type	Manual, Electric, Air or Intensifier Driven
	Pressure	Max 8400 PSI (580 Bar)
Hoses	Maximum pressure	700bar
Hydraulic oil	Type	Enerpac Type HF (ensure that any hydraulic oil alternatives that are used meet the same specifications)
	Minimum requirement	The purity of the medium is in accordance with: • Class 10 of NAS 1638 • Class 21/19/16 of ISO DIS 4406
	Viscosity	Viscosity grade 155 according the D2270 Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100°C

CYLINDER FEATURES		
Rated pull pressure	8400 psi	580 bar
Rated push pressure	4000 psi	280 bar
Rated pull capacity	70 Tons	69.653 kg
Rated push capacity	45 Tons	44.834 kg
Stroke	8.07 in	205 mm

WEIGHTS		
Item	**Weight**	**Can be carried by...**
Clamp	31 Kg	2 people
Swing arm	16 kg	1 person
Hydraulic cylinder	21 kg	1 person
Extension strip	19 kg	1 person

6.3 Dimensional table

Dimension	mm	in
A	2,950	116.14
B	1,056	41.6
C	601	23.7
D	502	19.8
E	586	23.1
F	361	14.2
G	90	3.5
H	349	13,7
I	361	14.2
J	41	1.6

6.2 Dimensional Callout Art

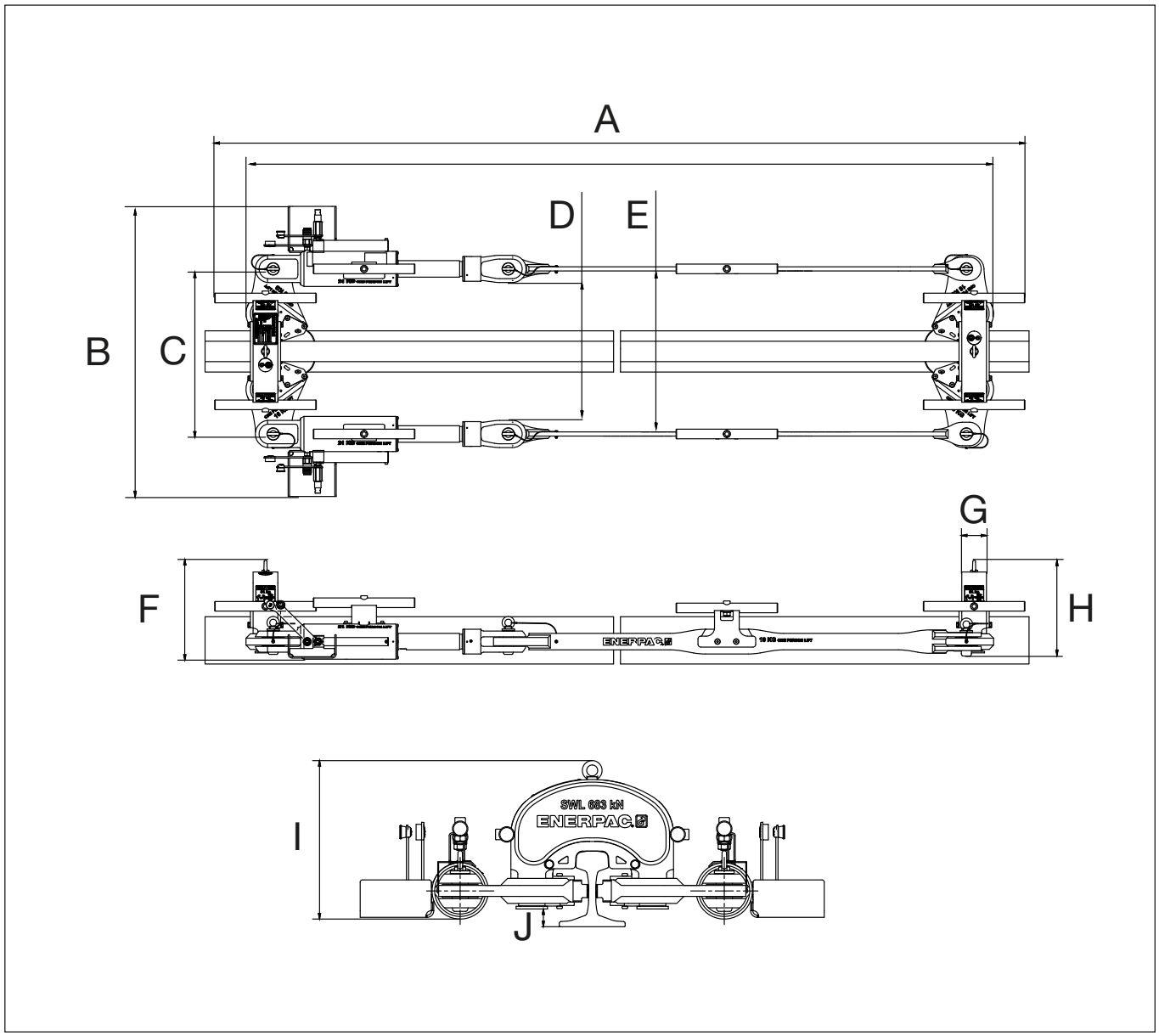


Figure 5: RP70A Dimensions

7. Operation

7.1 Initial Setup

7.1.1 Hoisting Instructions

Observe the weights and the required number of people to handle the parts as given in Section 6.1 “Table of Weights”.

The lifting points for lifting by hand are white painted.

To lift the swing arm assembly, use both hands

To lift the clamp with a tool, use the lifting eye of it.

7.2 Inspect the parts

Inspect all pivot points of the stressor for any unusual wear, contamination or debris.

Keep all pivot points clean and apply never-seize lubricant only where specified.

If any damage or unusual wear is noted, remove immediately from service.

Call Enerpac if assistance is required for solving problems.

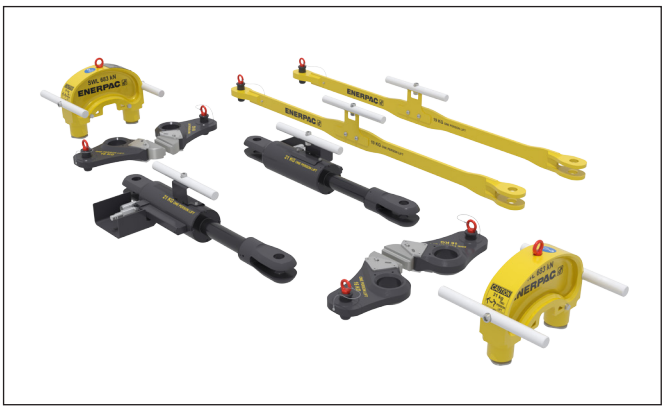


Figure 6: RP70A parts

7.3 Assemble the System

To assemble the system for pulling mode or for stretching mode, proceed as follows.

⚠ WARNING

Follow the safety measures as given in section 1 of this manual.

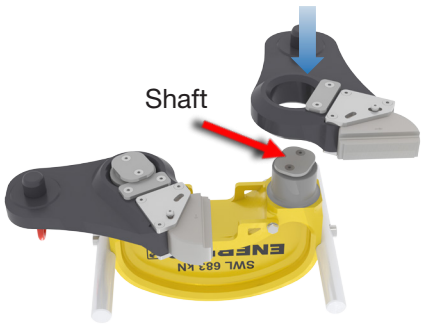
7.3.1 Test the hydraulics

1. Connect the hydraulics, as described in Section 7.3.3 “Connect the hydraulics”.
2. Use the powerpack to fully extend and retract the hydraulic cylinders.
3. Verify that the system is free from leaks.
4. Verify that the hydraulic cylinder piston rods are free from damage.
5. Maintain the system pressure for 5 minutes.
   - Verify that the system is free from leaks.
   - Verify that the pressure did not lower.
6. Release the pressure.
   - Disconnect the hydraulic hoses.
   - Replace the dust caps.

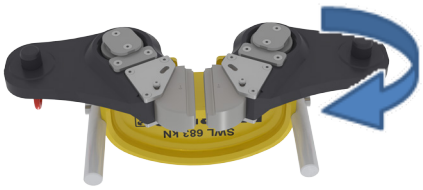
7.3.2 Install the swing arms on the clamps

To mount the four swing-arms on the two clamps, proceed as follows:

- Ensure that the teeth of the rail grips are clean, and free from cracks.
- If necessary, use a wire brush to remove dirt.
- Ensure that the teeth of the rail grips are free from cracks.
- If cracks are visible, then replace the clamps.



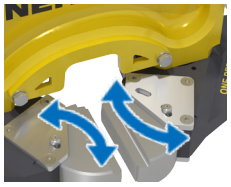
- Put the clamp upside down.
- Then, put the swing arms on the shaft of the clamp.



- Rotate the swing arm 90 degrees, to fixate it to the clamp.

- Verify that the arrows on the rail grips point in the direction as shown.

- Verify that the swing arms can move freely on the shafts of the clamp.
- Verify that there is no excessive play.



- Verify that the rail grips can rotate 5° in the swing arms.

⚠ WARNING

Do not use if the rail grips are seized.

7.3.3 Connect the hydraulics

To connect the hydraulics, proceed as follows:

1. Observe the directions as given in section 5.
2. Connect the hoses to the couplings of the hydraulic cylinders.

This procedure is valid both for the pulling and the stretching configuration.

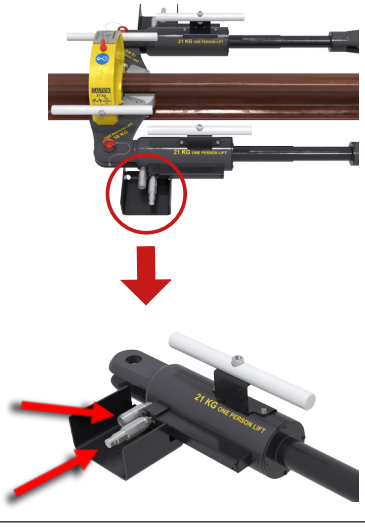
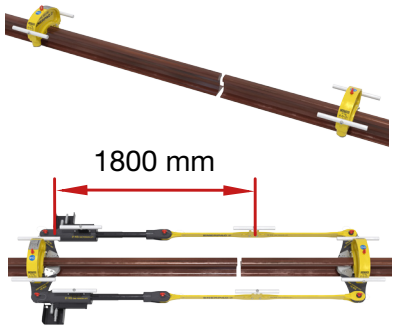


Figure 7: RP70A Couplers Connection

7.3.4 Pulling configuration



- Position the clamp assemblies onto the rail.

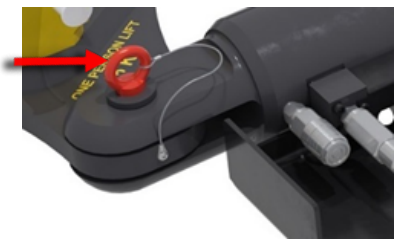
NOTICE

Preferably, position the clamps in such a way that distance between the welding point and the cylinders will be approx. 1800mm

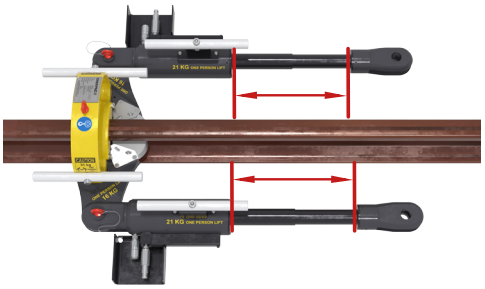
NOTICE

The welding point will be located near the lifting points of the extension strips.

- Rotate the swing arms so that the rail grips are positioned on the web symmetrically.



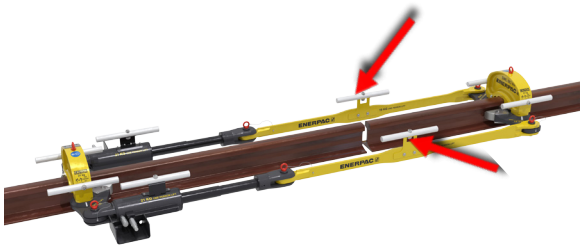
- Connect the hydraulic cylinder assemblies to the eyes of the swing arms.
- Ensure the connection pins are fully engaged.
- Verify that the pins in the fork and clevis ends fit easily without excessive play.



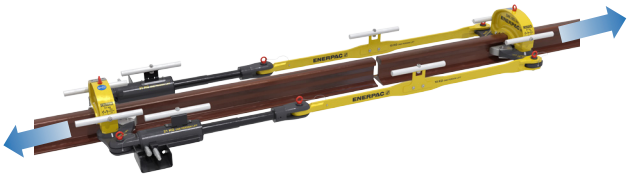
- Use the powerpack to extend the cylinders fully.

NOTICE

If partial extension is needed, due to the requirements of your operation, ensure that the cylinder rods are extended equally.



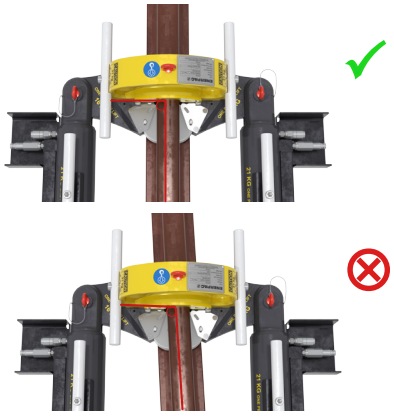
- Mount the extension strips.
- Make sure the connection pins are fully engaged.



- Open the swing arms a few degrees.
- Then, pull the clamp assemblies away from each other.

NOTICE

The grips will engage the rail web, and slack in the arms is removed.



- Ensure that the clamp assemblies are square to the rail.

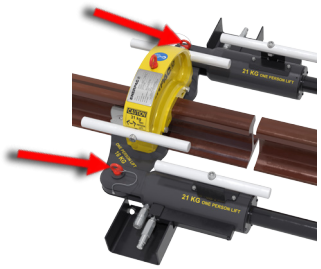
⚠ WARNING

Do not operate if the clamp assemblies are not square to the rail.

7.3.5 Stretching Configuration

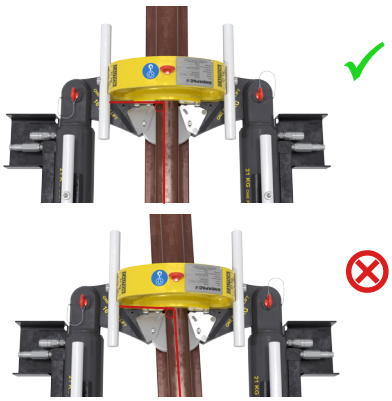
- Position the clamp assemblies onto the rail.

- Rotate the swing arms so that the rail grips are positioned on the web symmetrically.



- Connect the hydraulic cylinder assemblies to the eyes of the swing arms.
- Ensure the connection pins are fully engaged.
- Verify that the pins in the fork and clevis ends fit easily without excessive play.

- Connect the rods of the hydraulic cylinder assemblies to the other clamp.



- Ensure that the clamp assemblies are square to the rail.

⚠ WARNING

Do not operate if the clamp assemblies are not square to the rail.

7.4 Execute an operation

The following procedure outlines the correct method for operation.

Preconditions for executing an operation:

- The system has been mounted on the rail,
- The operator is familiar with the operation if the system.

⚠ WARNING

Do not remove rail grips or clips while the system is under tension on the rail. If rail movement occurs as anchors or clips are removed, the rail grips could lose their grip, allowing the system to slide rapidly and with extreme force along the rail in either direction. Serious personal injury and property damage could result if stressor strikes persons or objects in its path.

⚠ WARNING

Keep hands and feet away from cylinder and workpiece during operation.

⚠ WARNING

Use the safety measures as given in Section 1.

7.4.1 Pulling and stretching

Operation procedures will vary, depending on hydraulic pump type, valve configuration and other factors. For detailed operating instructions and related information, refer to the instruction sheet included with your pump.

1. Observe the general risks and warnings as given in section 1.
2. Operate the powerpack to retract (for pulling) or extend (for stretching) the cylinders.
3. Monitor the pressure during operation.

⚠ WARNING

Do not exceed the rated input pressure as given in Section 6.1.

4. Close the load lock valve on the powerpack.
5. Operate the powerpack source until the required gap (pulling mode) or the required stretch (stretching mode) is obtained.

NOTICE

It is mandatory that the operator has a full understanding of all instructions, safety precautions and applicable safety regulations before operating any high force hydraulic equipment. If questions or concerns, contact your local Enerpac Distributor or Authorized Service Center.

7.4.2 Finish the operation

1. Release the load lock valve.
   - For pulling: Extend the hydraulic cylinders until all loads are removed from the assembly.
   - For stretching: Retract the hydraulic cylinders until all loads are removed from the assembly.
2. Remove all connector pins.
3. Use the powerpack to fully retract the hydraulic cylinders.
4. Release any trapped pressure from stressor by shifting the control valve on the powerpack before connecting or disconnecting hoses.

⚠ WARNING

Never disconnect any other hydraulic connections on the stressor to release trapped pressure. See Troubleshooting Guide for correct procedure to release trapped pressure in the stressor hydraulic circuit.

5. Disconnect the hoses.
6. Clean the hydraulic components and couplings.
7. Refit the quick release coupling dust caps.

8. Storage

8.1 System

- Retract the cylinders.
- Coat the pins and clamp pivot bearings, to provide protection from wear and corrosion.

NOTICE

Lubrication of these surfaces is not required.

- Apply oil as a rust preventer to the inside surfaces of swing arms and at holes for connector pins.
- Keep contact surfaces of swing arms and clamps clean and oiled allowing swing arms to move freely.
- Lubricate the grips with light oil to prevent corrosion.
- Apply dust caps to hydraulic couplers.
- Storage.

Short term storage:

Cover the system with a tarpaulin in order to it dry, especially when stored in open air.

NOTICE

The tarpaulin is not included in the delivery but can be added as an option.

Long term storage:

Enerpac recommends a dry and closed space.

NOTICE

For storage temperature of the system reference is made in Section 6.1.

8.2 Hydraulic hoses

- Store hoses in a frost-free, cool, dry space with medium air humidity (condensation free).
- Keep hoses out of direct sunlight (UV radiation).
- Keep hoses out of the outlet flow of ventilators (drying effect).

- Do not store hoses in direct sunlight; the heat of the sun may cause unexpected raise of pressure.
- Protect hoses against exposure to ozone (released during welding work).
- Ozone causes accelerated ageing of hoses (splitting due to dryness).
- Protect hoses against dirt and moisture.
- Preferably store hoses in a horizontal position.

When hoses are stored in vertical position use hose brackets with a bend radius of at least 200 mm, or more for larger hose diameter, according to the specifications of the manufacturer.

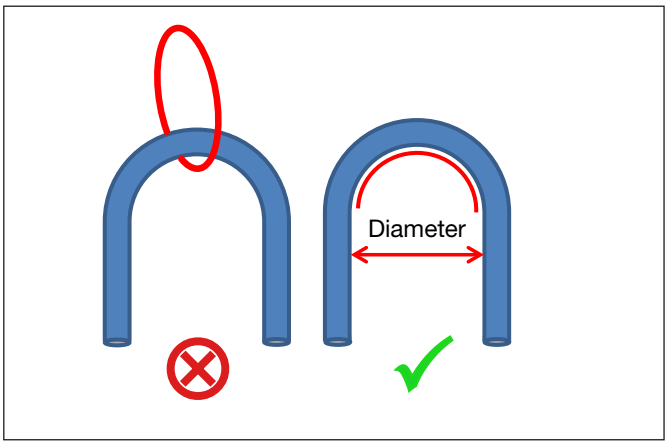


Figure 8: Hose bracket

9. Maintenance

Keep the machine in good condition to obtain optimum performance from your machine and to guarantee the safety of the users.

NOTICE

Only perform maintenance on the system if not in use.

NOTICE

If the system has been idle for more than 12 months than it shall be inspected prior to use completely.

9.1 Rules to be observed for maintenance

Due to the regulations as stated in "ASME B30.1-2015" observe the following rules for maintenance:

1. If the system was idle for at least 12 months, all inspections as listed in the following section with a prescribed frequency of at least 12 months have to be performed.
2. Prior to use, all new, altered, modified, or repaired hydraulic components shall be inspected to verify compliance with the applicable provisions of this section. Written records are not required.
3. Only perform maintenance if the system is not under load.
4. Follow all safety instructions in this manual.
5. When working with flammable liquids, take the applicable safety regulations into account.
6. Make certain that the hydraulic system is not under pressure.
7. If maintenance has to be executed while the system is running then a person has to be present to supervise, and to stop the machine if needed.
8. Do not spill any oil and similar fluids. Be mindful of the environment and the costs of cleaning up.
9. Make certain that you apply personal protection equipment (PPE) and take any other safety precautions required by the working conditions.
10. Make sure that you know the location of fire alarms, firefighting facilities and fire extinguishers.
11. Only use suitable work equipment. Prevent damage due to use of unsuitable equipment.
12. Without the express consent of the manufacturer, you are not allowed to make any changes, additions or adjustments to the system which affect the safety of the machine.
13. Make certain that the system is made ready for operation after the maintenance work was been completed. Inform the operator.

9.2 Lubrication and cleaning

The points to be lubricated are shown below.

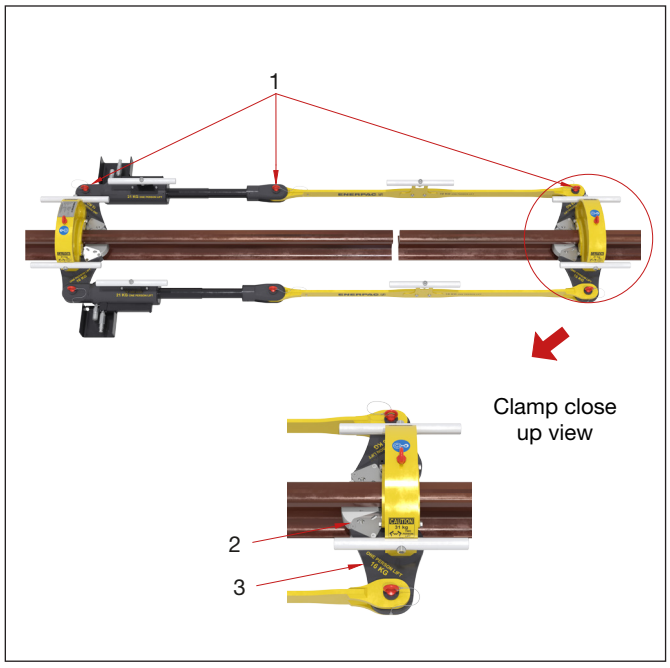


Figure 9: Lubrication Points

1. Connector pins and holes
2. Rail grips
3. Swing arm

9.3 Dismantling the system

To dismantle the system at the end of its lifetime, proceed as follows:

1. Drain the fluids like hydraulic oil and lubricating oil.
2. Dismount rubber and plastic components.
3. Dismount the metal components.

Collect all material, sort it and let it be recycled by a specialized company.

10. Parts List

10.1 Clamp

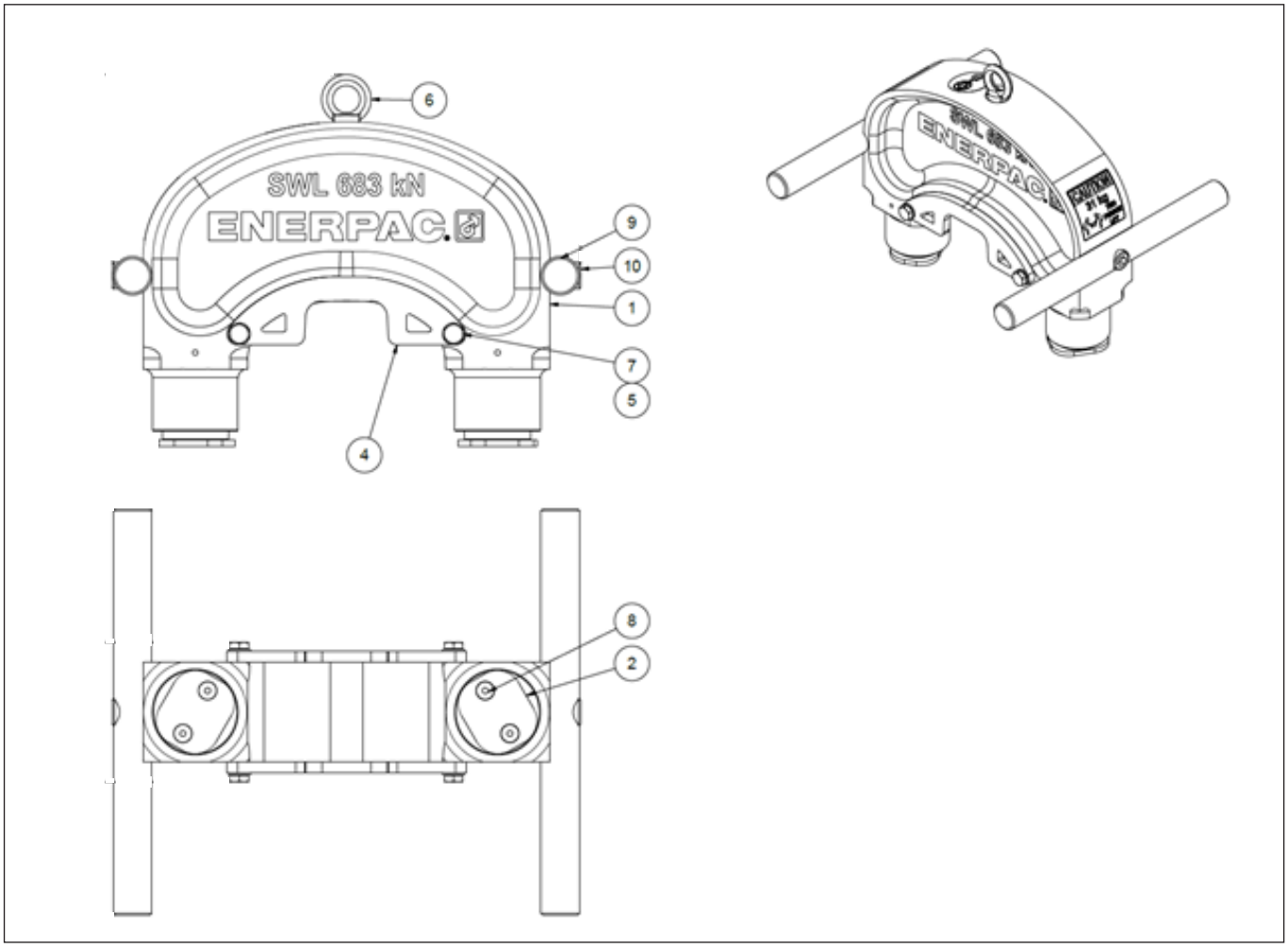


Figure 10: Clamp Main Components

Repair Parts List, Figure 10			
Item	**Description**	**Qty.**	**Part number**
1	Clamp	1	0393901010001
2	Shaft End Plate	2	0393901010004
4	Positioning Plate 60E1	2	0393901010011
5	Washer	4	B38130.100.001
6	Lifting Eyebolt	1	B16010.100.001R
7	Hex-Head Bolt	4	B01210.100.025
8	Hexagon socket countersunk head cap screws	4	B07470.080.020
9	Handle	2	0393901010014
10	Hex SHCS low head	2	B07090.160.040

10.2 Extension Strip

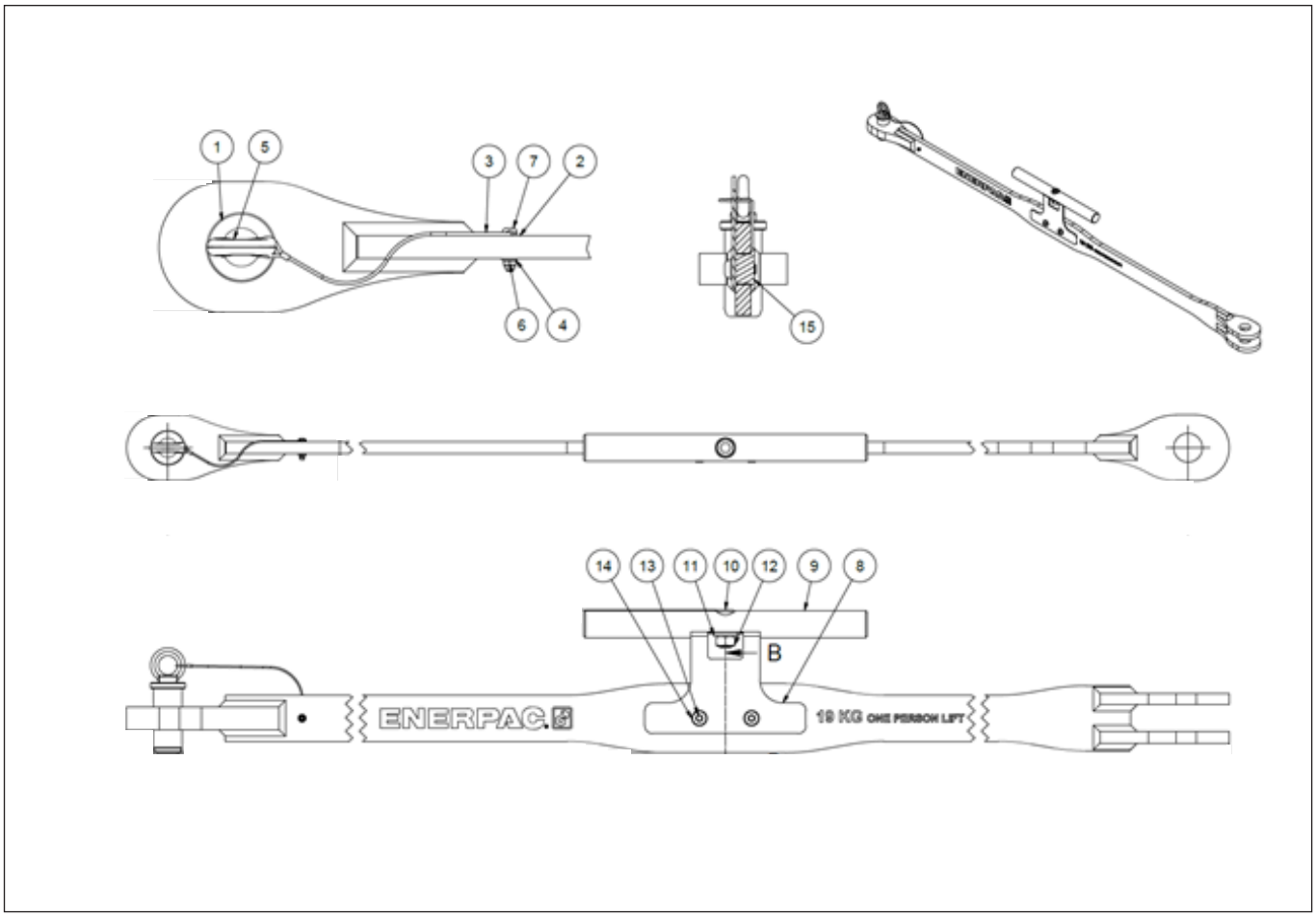


Figure 11: Extension Strip Main Components

Repair Parts List, Figure 11			
Item	**Description**	**Qty.**	**Part number**
1	Connection Pin	1	0393901010009
2	Weld Extension Strip	1	03939010101
3	Cable	1	03199-0300
4	Washer	2	B38130.050.001
5	Lifting Eyebolt	1	B16010.100.001R
6	Hex Nut	1	B12348.050.001
7	Hexagon Socket Button Head Screw	1	B07151.050.025
8	Strip Handle Plate	1	0393901010015
9	Handle	1	0393901010014
10	Hex SHCS low head	1	B07090.160.040
11	Plain washer	1	B38130.160.001
12	Hex Nut	1	B01100.160.001
13	Hex SBHS	2	B07151.100.025
14	Plain washer	2	B38130.100.001
15	Handle Filler Block	1	0393901010016

10.3 Gripper Arm

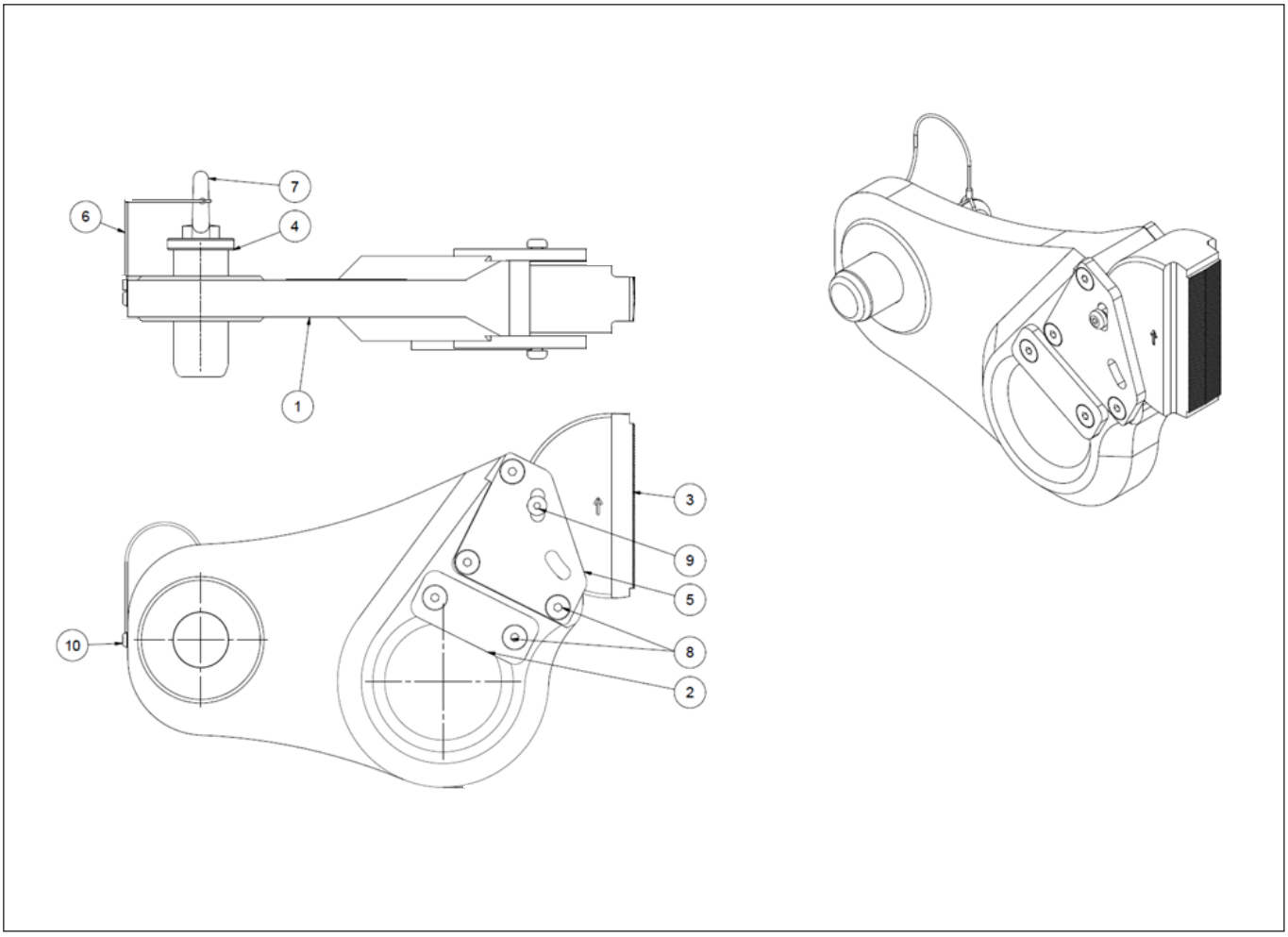


Figure 12: Gripper Arm Main Components

Repair Parts List, Figure 12			
Item	**Description**	**Qty.**	**Part number**
1	Gripper Arm	1	0393901010002
2	Lock Plate	1	0393901010003
3	Gripper	1	0393901010005
4	Connection Pin	1	0393901010009
5	Gripper Lock Plate	2	0393901010012
6	Cable	1	03199-0300
7	Lifting Eyebolt	1	B16010.100.001R
8	Hexagon socket countersunk head cap screws	8	B07470.080.020
9	Hexagon socket head shoulder screws	2	B07111.060.012
10	Hexagon Socket Button Head Screw	1	B07151.050.010

10.4 Cylinder

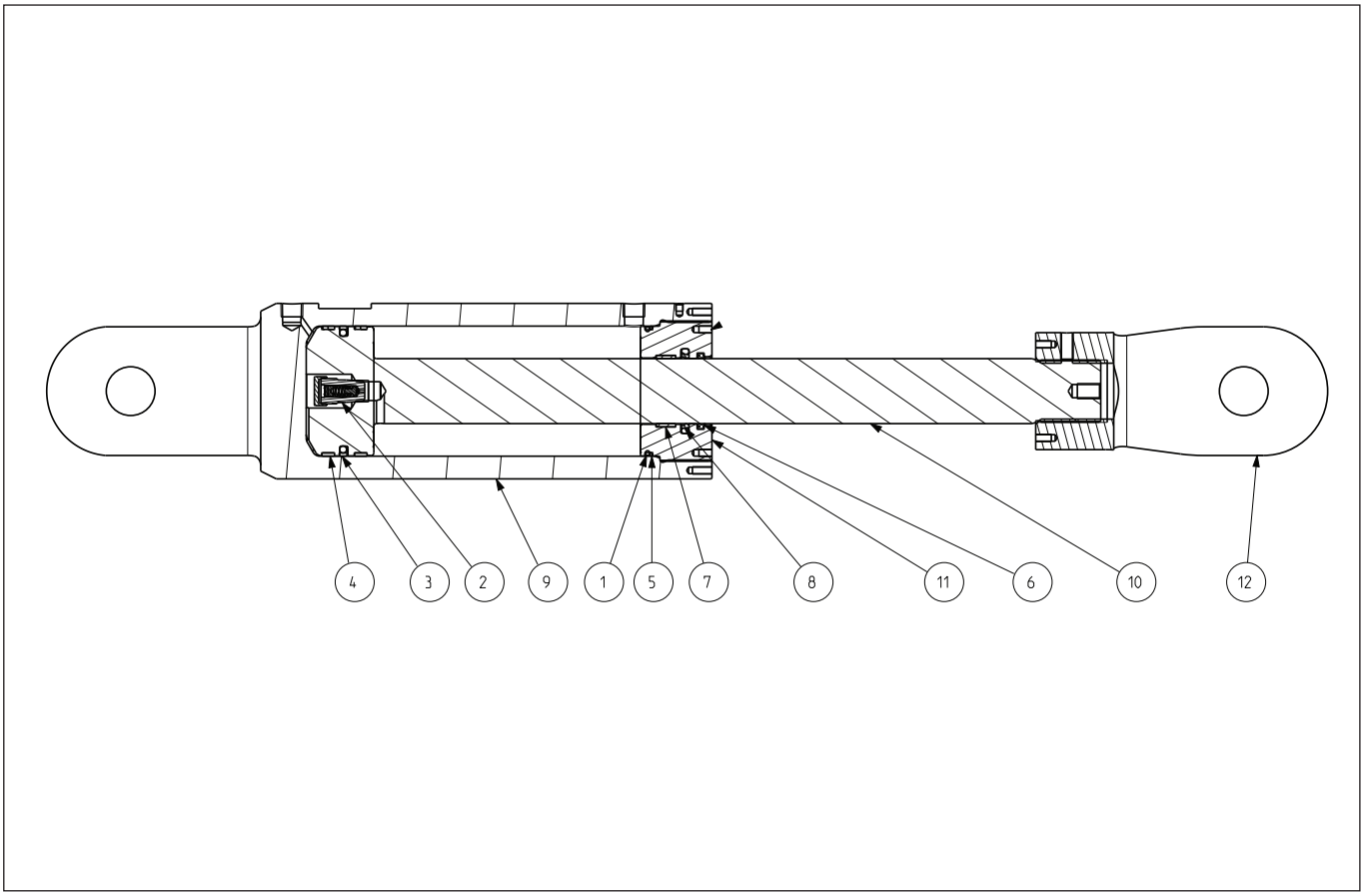


Figure 13: Pull Cylinder Main Components (first view)

Repair Parts List, Figure 13			
Item	**Description**	**Qty.**	**Part number**
1	O-Ring	1	▲
2	Relief valve assembly	1	▲
3	Seal-piston	1	DB8051076
4	Bearing- piston	2	▲
5	Backup ring	1	▲
6	Scraper	1	▲
7	Rod-wear ring	1	▲
8	Step seal with o-ring	1	DQ2194514
9	Cylinder base	1	DQ2180030
10	Plunger	1	DQ2181040
11	Stop ring	1	DQ2182044
12	Clevis eye	1	▲
▲ Indicated item included in and available only as a part of the Seal Kit RARP358K1			

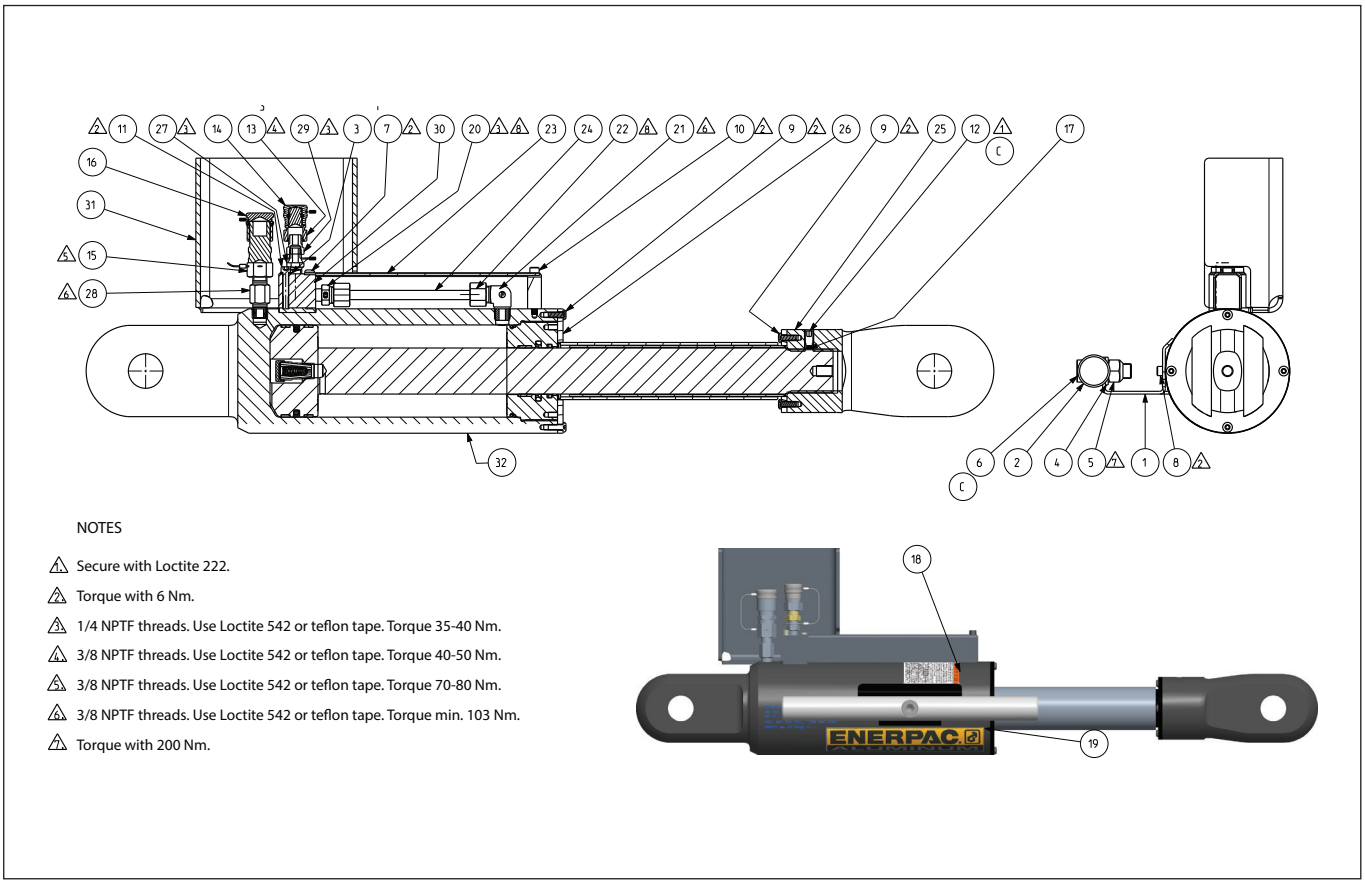


Figure 14: Cylinder Main Components (second view)

Repair Parts List, Figure 14			
Item	**Description**	**Qty.**	**Part number**
1	Cylinder handle plate	1	0393901010017
2	Handle	1	0393901010014A
3	Washer-flat	2	CAE1060108-1A
4	Washer-flat	1	CAE1160108-1A
5	Nut-lock	1	CBE1160120-2A
6	Screw LHCS M16x2 x 50	1	CBE1633028-1D
7	Screw BHCS M6x1 x 8	1	CBE613028-1E
8	Screw SHCS M6x10	2	CBE615028-1A
9	Screw BHCS M6x1 x 16	8	CBE619028-1E
10	Screw SHCS M6x45	1	CBE631028-1A
11	Screw SHCS M6x50	2	CBE633028-1A
12	Screw-set	1	CCA1019028-5E
13	Coupler male half	1	CS364900
14	Metal dust cap for S364900	1	CS364900E100
15	Coupler female half	1	CS365900
16	Metal dust cap for S365900	1	CS365900E100
17	Nylon disc	1	CZ324071
18	Warning decal	1	DA5625026
19	Decal Enerpac	1	DC5667026
20	Fitting-straight	1	DQ2152096
21	Fitting-elbow	1	DQ2153096
22	Nut	2	DQ2154124

Repair Parts List, Figure 14			
Item	**Description**	**Qty.**	**Part number**
23	Cover	1	DQ2186098
24	Tube	1	DQ2187268
25	Sleeve	1	DQ2190900
26	Sleeve	1	DQ2191900
27	1/4” HEX nipple	1	FZ1608
28	.375 NPTF fitting	1	FZ1619
29	Reducer bushing 3/8”-1/4”	1	FZ1630
30	Connector block	1	RAR5015E100270
31	Cover left	1	RAR5015E101098L
32	Aluminium pull cyliinder 35 Ton D/A 205 mm	1	RARP358S

11. Troubleshooting

Refer to the troubleshooting guide when diagnosing tool operational problems. Please note that the troubleshooting guide is not all-inclusive and should only be considered as an aid to help diagnose the most common possible problems. For repair service, contact your nearest Enerpac Authorized Service Center. As required, also refer to the troubleshooting information provided with your hydraulic pump or power unit.

Troubleshooting Guide		
Symptom	**Possible Cause**	**Solution**
1. Plunger will not pull.	a. Pump release valve open.	Close pump release valve.
	b. Directional control valve not in proper position.	Shift directional control valve to proper position.
	c. Coupler not fully tightened.	Tighten coupler.
	d. Pump oil level is low.	Add oil to pump reservoir as required.
	e. Pump malfunctioning.	Repair or replace pump as required.
	f. Cylinder load rating too low for application.	Use a cylinder with a higher load rating.
	g. Cylinder seals leaking.	Repair or replace cylinder.
2. Plunger retracts only part way.	a. Oil level in pump is low.	Add oil to pump reservoir as required.
	b. Coupler is not fully tightened.	Tighten coupler.
	c. Cylinder plunger binding.	Repair or replace cylinder.
3. Plunger retracts erratically.	a. Air in hydraulic system.	Remove air from hydraulic system.
	b. Cylinder plunger binding.	Repair or replace cylinder.
4. Plunger moves more slowly than normal.	a. Leaking connection.	Repair leaking connection.
	b. Coupler not fully tightened.	Tighten coupler.
	c. Pump malfunctioning.	Repair or replace pump as required.
5. Plunger retracts but will not hold.	a. Pump malfunctioning.	Repair or replace pump as required.
	b. Leaking connection.	Repair leaking connection.
	c. Incorrect system set-up.	Check hose connections at pump and cylinders.
	d. Cylinder seals leaking.	Repair or replace cylinder.
6. Cylinder leaks oil.	a. Worn or damaged cylinder seals.	Repair or replace cylinder.
	b. Internal cylinder damage.	Repair or replace cylinder.
	c. Loose connection.	Tighten or repair connection.
7. Plunger will not retract or retracts more slowly than normal.	a. Pump release valve closed.	Open pump release valve.
	b. Directional control valve not in proper position.	Shift directional control valve to proper position.
	c. Pump reservoir is overfilled.	Drain oil from pump reservoir as required.
	d. Improper hose connections.	Check hose connections.
	e. Narrow hose restricting oil flow.	Replace with larger diameter hose.
	f. Internal cylinder damage.	Repair or replace cylinder.

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