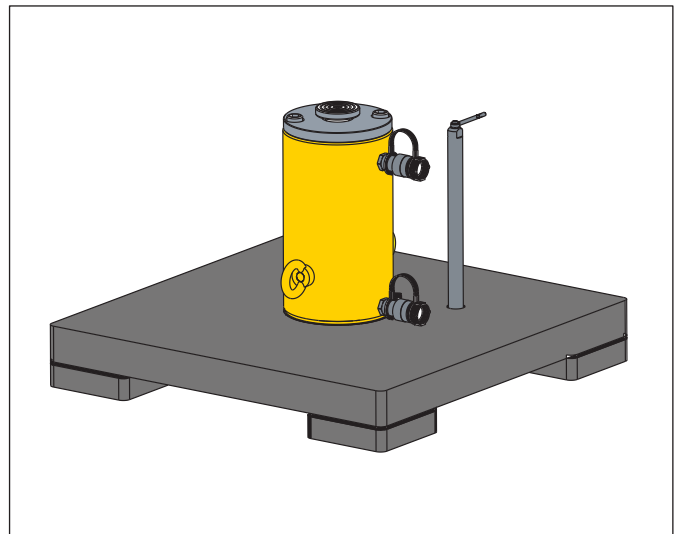


L4155 Rev. A 3/16

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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 a local Enerpac distributor for clarification.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for a free Enerpac Hydraulic 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 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 relating to property damage). Please note that the Safety Alert Symbol will **not** be used with this signal word.

2.2 General 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 a relief valve to a higher pressure than the maximum rated pressure of the pump.
- The BLS Series Climbing Jacks are designed for a maximum pressure of 690 Bar [10,000 psi]. Do not connect a pump with a higher pressure rating to these jacks.
- Wear personal protective gear when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- Stay clear of loads supported by hydraulics. To avoid personal injury, keep hands and feet away from jack and work piece during operation.

- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, see a doctor immediately.
- A jack when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it always must be blocked mechanically.
- Do not pressurize disconnected couplers.
- Only use hydraulic jacks in a coupled system. Never use a jack with uncoupled couplers. If the jack becomes extremely overloaded, components can fail catastrophically, causing severe personal injury.
- Use only rigid pieces to hold loads. Carefully select steel aluminum or wood blocks (Refer to Section 10.1 for additional information) that are capable of supporting the load. Never use a hydraulic jack as a shim or spacer in any lifting or pressing application.
- When using a single BLS Series jack, avoid situations where loads are not directly centered on the cylinder tilt swivel. The load may slip or fall, causing potential danger. Note: although usable individually, BLS Series jacks are designed to be used in groups. Multiple BLS Series jacks will be required for most lifting applications.
- 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.
- Do not exceed equipment ratings. Never attempt to lift a load weighing more than the capacity of the jack. Overloading causes equipment failure and possible personal injury.
- Be sure setup is stable before lifting load. Jacks should be placed on a flat surface that can support the load. Do not weld or otherwise modify the jack to attach a base or other support.

CAUTION

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

- 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.
- When using a single BLS Series jack, distribute the load evenly across the entire saddle surface.
- 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 65°C [150°F] 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.

NOTICE

- 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 only Enerpac oil.

2.3 Additional Safety Precautions - BLS Series Climbing Jacks

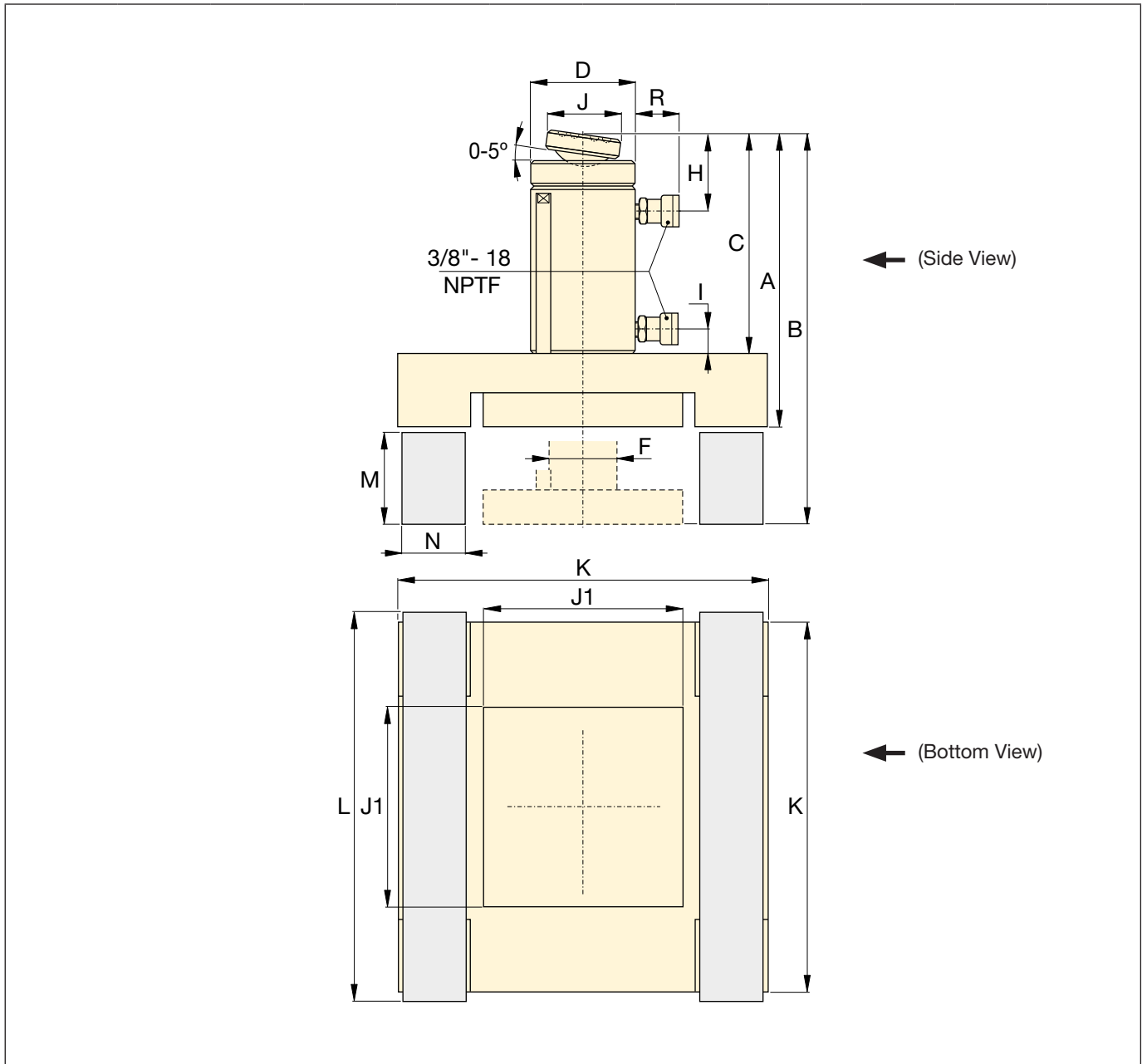
WARNING

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

- Always do a visual check of each jack before placing it into operation. If any problems are found, do not use the jack. Have the jack repaired and tested before it is placed into operation.
- Never use a jack that is leaking oil.
- Always lift the jack using a crane or other suitable lifting device of sufficient rated capacity. Use only the supplied jack lifting eyes to attach the jack to the lifting device.
- Allow only trained and experienced personnel to supervise and perform lifting and lowering procedures.
- Be certain that no persons are working on or near any jacks before lifting or lowering of the load begins. Alert all personnel in advance that lifting or lowering is about to occur.
- Keep all personnel clear of the work area while lifting or lowering is in progress.
- Maintain communication with the operator at all times during lifting or lowering 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.
- Use caution when inserting or removing cribbing blocks while the jack plunger is extended. Keep hands and fingers clear of pinch and crush points.
- Never attempt to insert, remove or adjust the position of cribbing blocks while the jack is lifting or lowering.
- Operate pump and valves as required to ensure that the load is lifted and lowered evenly.
- Closely watch the load at all times during lifting and lowering. Stop lifting or lowering immediately if the load becomes unstable or appears to be lifting or lowering unevenly.
- Use cribbing blocks of the proper material and size for the jack model being used. Refer to instructions and precautions contained in Section 10.1. Also refer to Sections 3.1 and 3.2 for cribbing block dimensions.
- If cribbing blocks begin to crush, deform, crack or splinter, stop lifting or lowering immediately.
- Ensure that the cribbing block column remains straight as lifting or lowering is in progress. If cribbing blocks begin to slide, or if the column tilts or leans, stop lifting or lowering immediately.
- Read and completely understand the safety precautions and instructions in this manual before operating the jack or preparing it for use.
- Operating procedures will vary, depending on the pump being used with the jacks. Always read, follow and completely understand all manufacturer's instructions when operating devices used with the jacks. Follow all safety precautions contained in the manufacturer's manuals.
- Always fully relieve hydraulic pressure before loosening hydraulic connections or performing any jack disassembly or repair procedures.
- Always be certain that the load is fully removed from the jack before performing any jack disassembly or repair procedures.
- Refer to sections 10.1, 10.2 and 10.3 for additional jack safety precautions.
- Always read, understand and follow all safety precautions and instructions, including those that are contained within the procedures of this manual.

3.0 DIMENSIONS

3.1 Dimensions (Metric)



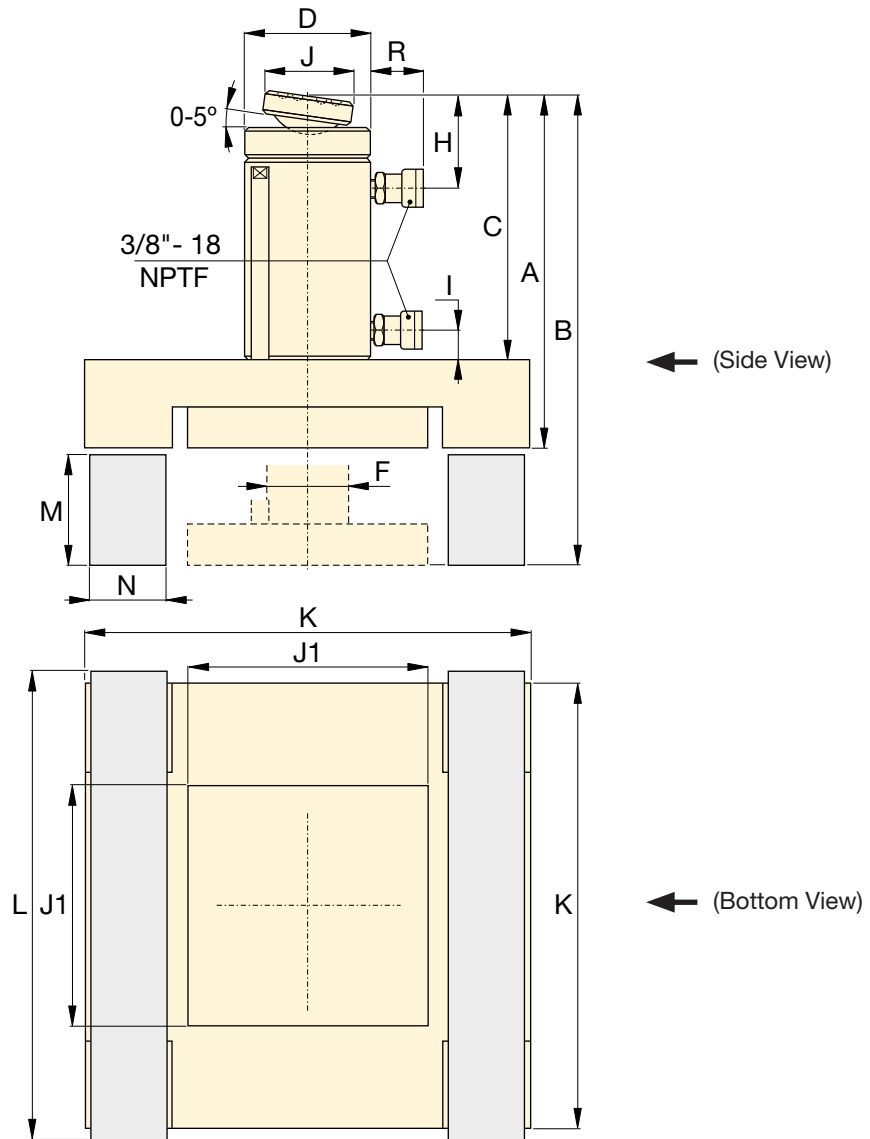
Model No.	BLS Series Climbing Jacks - Dimensions (in millimeters)										
	A	B	C	D	F	H	I	J	J1	K	R
BLS-506	406	556	318	127	79	56	36	50	240	515	61
BLS-1006	445	606	343	177	95	76	24	71	330	670	61
BLS-1506	472	624	370	203	114	94	39	130	230	475	61
BLS-2006	510	661	387	248	133	102	37	130	270	550	61

NOTICE Dimensions are approximate and are subject to change without notice.
Lifting eyes and anti-rotation rod are not shown.

Model No.	Cribbing Block Dimensions (in millimeters)			Required Cribbing Block Material:
	L	M	N	
BLS-506	565	140	120	Azobe Wood
BLS-1006	720	150	160	
BLS-1506	500	140	115	Solid Aluminum or Steel
BLS-2006	575	140	135	

NOTICE Cribbing blocks are **not** included with jack.

3.2 Dimensions (Imperial)



Model No.	BLS Series Climbing Jacks - Dimensions (in inches)										
	A	B	C	D	F	H	I	J	J1	K	R
BLS-506	15.98	21.89	12.52	5.00	3.11	2.24	1.42	1.97	9.45	20.28	2.4
BLS-1006	17.52	23.86	13.50	6.97	3.74	2.99	0.94	2.80	12.99	26.38	2.4
BLS-1506	18.58	24.57	14.57	8.00	4.49	3.70	1.54	5.12	9.06	18.70	2.4
BLS-2006	20.08	26.02	15.24	9.76	5.24	4.02	1.46	5.12	10.63	21.65	2.4

NOTICE Dimensions are approximate and are subject to change without notice.
Lifting eyes and anti-rotation rod are not shown.

Model No.	Cribbing Block Dimensions (in inches)			Required Cribbing Block Material:
	L	M	N	
BLS-506	22.24	5.51	4.72	Azobe Wood
BLS-1006	28.35	5.91	6.30	
BLS-1506	19.69	5.51	4.53	Solid Aluminum or Steel
BLS-2006	22.64	5.51	5.31	

NOTICE Cribbing blocks are **not** included with jack.

4.0 PRODUCT SPECIFICATIONS AND FEATURES

4.1 Specifications (Metric)

Model No.	Cylinder Class	Maximum Cylinder Capacity (per lifting point)		Max. Stroke	Effective Cylinder Area		Oil Capacity		Weight	Hydraulic Connections
		kN			cm ²		cm ³			
	tonnes	Push	Pull	mm	Push	Pull	Push	Pull	kg	
BLS-506	50	498	103	150	71.2	21.5	1111	335	170	3/8" -18 NPTF
BLS-1006	95	933	435	161	133.0	62.2	2238	1045	315	3/8" -18 NPTF
BLS-1506	140	1386	668	151	198.1	95.4	3090	1488	322	3/8" -18 NPTF
BLS-2006	200	1995	1017	151	285.0	145.3	4332	2209	373	3/8" -18 NPTF

4.2 Specifications (Imperial)

Model No.	Cylinder Class	Maximum Cylinder Capacity (per lifting point)		Max. Stroke	Effective Cylinder Area		Oil Capacity		Weight	Hydraulic Connections
		tons			in ²		in ³			
	tons	Push	Pull	in	Push	Pull	Push	Pull	lb	
BLS-506	55	55	12	5.91	11.04	3.33	67.80	20.44	375	3/8" -18 NPTF
BLS-1006	105	105	48	6.34	20.66	9.64	136.57	63.77	695	3/8" -18 NPTF
BLS-1506	154	154	74	5.94	30.71	14.79	188.56	90.80	710	3/8" -18 NPTF
BLS-2006	220	220	113	5.94	44.21	22.50	264.35	134.80	825	3/8" -18 NPTF

4.3 Major Features and Components

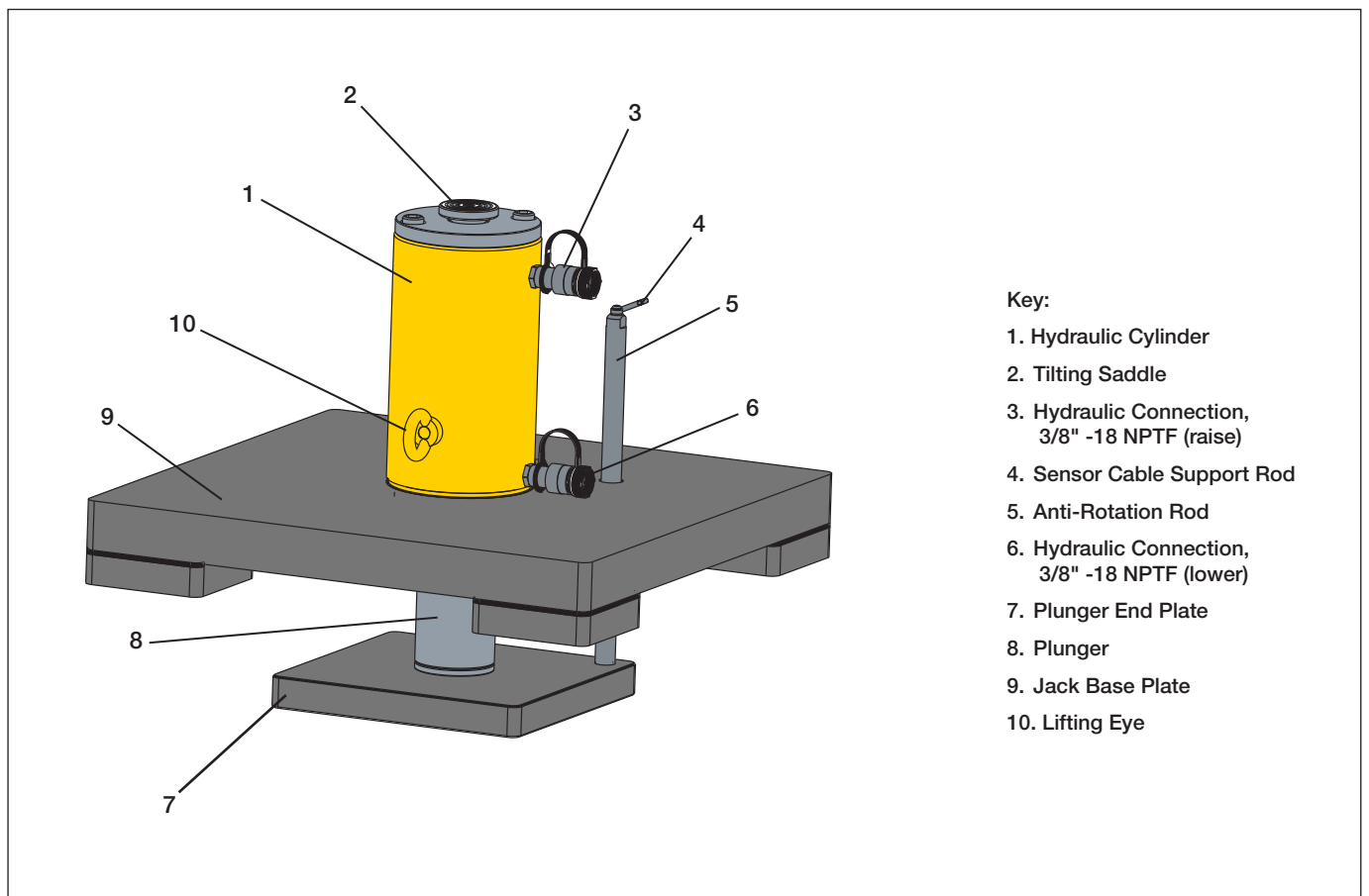


Figure 1, BLS Series Climbing Jack

5.0 PRODUCT DESCRIPTION

5.1 Introduction

Enerpac BLS Series Climbing Jacks overcome the usual limitation of lift height imposed by the jack's plunger stroke length.

Large objects, such as oil tanks, can be lifted, held and lowered for maintenance without use of a crane.

Features include:

- Double-acting hydraulic cylinder with solid plunger design.
- Built-in tilt saddle allows maximum tilt angles up to 5 degrees.
- Large base with anti-rotation rod for stability and safety.
- Baked enamel finish for increased corrosion resistance.
- Enerpac CR-400 hydraulic couplers allow easy connections.

5.2 Stage Lifting Overview

For many lifting applications, the jack stroke can not be made long enough to lift the load to the required height. There is a direct relationship between the stroke length and the collapsed height of a jack. This relationship often prevents a jack with the proper stroke length from also fitting in the required position to lift the load correctly. When these limitations are experienced, sometimes stage lifting is the only solution.

Stage lifting is the process of lifting the load to the maximum stroke of the jack and then "cribbing" or holding, the load at this point. After this is done and the load is secure, the jack is retracted, cribbing is then placed under the jack and then the cycle is repeated. This stage lifting cycle allows the load to be lifted many times the stroke of the jack and total height is only limited by the strength and stability of the cribbing system.

The BLS Series Climbing Jacks feature an integral tilt saddle and plunger end plate. These attachments facilitate the cribbing application, by providing reaction points for both the load and the plunger cribbing reaction points.

Although they can be used individually, the BLS Series Climbing Jacks are most often used as part of a multi-jack lifting arrangement.

Multi-jack lifting arrangements are typically powered by an Enerpac split flow pump or by an Enerpac synchronous lifting system (sold separately).

6.0 HYDRAULIC POWER SOURCES

6.1 Recommended Hydraulic Power Sources

The following hydraulic power sources are recommended for use with Enerpac BLS Series Climbing jacks:

Enerpac SFP Series split flow pump: The SFP Series provides multiple hydraulic outlets, each with equal oil flow. For multi-point lifting applications, a split flow pump is a better and more convenient alternative to using separately operated pumps for each jack.

Enerpac EVO Series synchronous lifting system: The EVO Series is the ultimate system for multi-point stage lifting. It is capable of powering four, eight or twelve interlinked jacks, depending on the model chosen. The EVO Series features nine separate work modes, including a dedicated work mode designed especially for stage lifting.

Contact your Enerpac distributor for additional information regarding SFP and EVO Series products.

6.2 Use of Separate Pumps

If desired, each BLS Series Climbing Jack can be powered by its own separate hydraulic pump. This arrangement, while permissible, is not recommended. Using separate pumps will require greater operator oversight to ensure that the load remains level during lifting or lowering.

When using separate pumps, each pump must be equipped with a 4-way tandem-center control valve. A locking tandem center valve is preferred. The pump maximum pressure must be regulated by a relief valve and must not exceed 690 bar [10,000 psi].

WARNING It is the user's responsibility to ensure that the hydraulic power source is suitable for use with the BLS Series jacks and that it is capable of providing precise control of both lifting and lowering. Failure to use the proper hydraulic power source could result in loss of load. Death or serious personal injury could occur.

7.0 STROKE POSITION SENSOR

If the jacks will be used with an Enerpac EVO Series synchronous lifting system, stroke position sensors must be installed at all lifting points. Each BLS Series jack includes provisions for mounting a stroke position sensor.

NOTICE Stroke position sensors are available from Enerpac as optional accessories and are not included with the BLS Series jacks.

Install the stroke position sensor on each jack as described in the following steps. Refer to figures 2 and 3.

1. Install the sensor cable support rod to the top of the anti-rotation rod. Use the supplied M6 x 20 mm bolt. Both the support rod and bolt are shipped loose with the jack.
2. Place the sensor (with magnetic base) on the top surface of the jack base plate. Position the sensor so that the end of the sensor cable is aligned with the support rod.
3. Extend the sensor cable and attach it to the support rod. Adjust the position of the sensor and sensor cable, so that the cable is parallel with the anti-rotation rod.

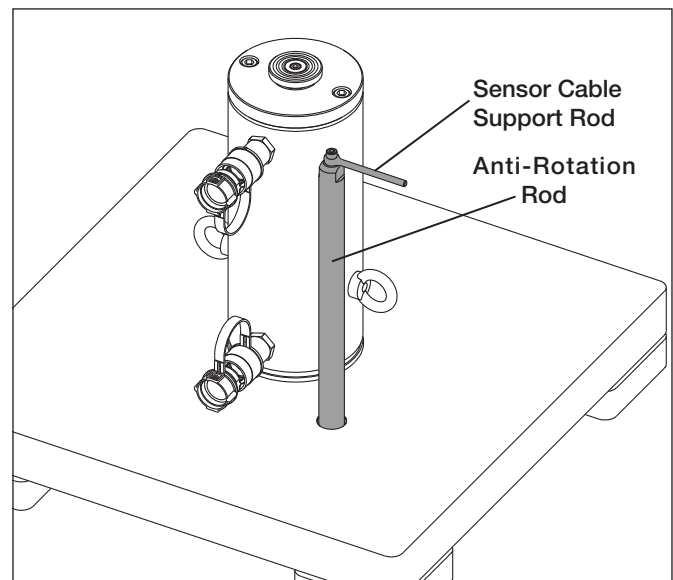


Figure 2, Anti-Rotation Rod and Cable Support Rod

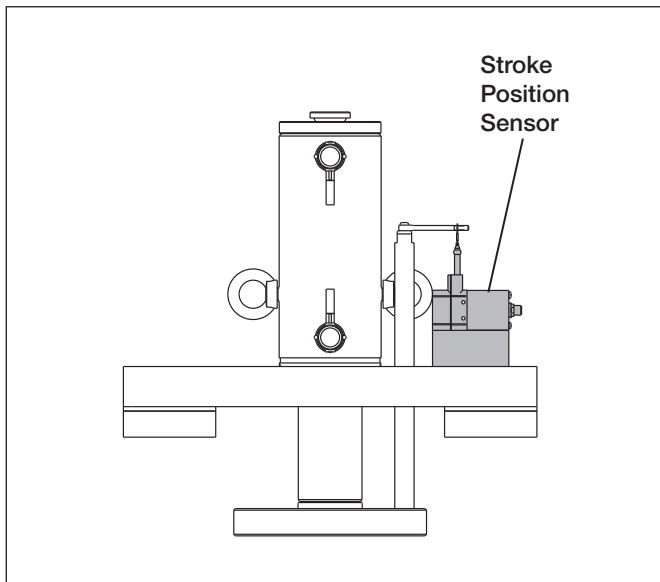


Figure 3, Stroke Position Sensor Installation (typical)

8.0 HYDRAULIC CONNECTIONS

⚠ WARNING Be certain that hoses are connected at **BOTH** cylinder couplers. Never attempt to pressurize the cylinder if only one hose is connected. Catastrophic failure of hoses, couplings or cylinder components could occur. Death or serious personal injury could result.

1. Remove dust covers/rubber plugs from hydraulic couplers.
2. Inspect all threads and fittings for signs of wear or damage and replace as needed.
3. Clean all threads and fittings.
4. Make hydraulic connections. The jacks are double-acting (two hoses per jack) and are hydraulically powered in both directions. The pump or lifting system must be equipped with a 4-way control valve.
5. Fully hand-tighten all couplers. Loose coupler connections will block the flow of oil between the pump and the jack.

9.0 SET-UP AND INSPECTION

9.1 Before Operation

- The hydraulic pump or lifting system must include a safety relief valve to prevent over-pressurizing the jacks. Verify that the relief valve is set at 690 bar [10,000 psi] maximum.
- If a split flow hydraulic pump is being used, a counterbalance valve or flow control valve must be installed at each jack in the circuit. This will allow controlled lowering of the load. Contact Enerpac for additional information.
- Prior to use, ensure that oil is clean and free of contaminants. Enerpac recommends a minimum system fluid cleanliness level in accordance with NAS (National Aerospace Standard) 1638 Class 8.
- With all jacks fully retracted, check the oil level in the reservoir. Add oil if oil level is low.
- Without load, operate the hydraulic pump to advance and retract the jack(s) and to purge any air from the system. Refer to Section 9.2 for additional instructions.
- Check for leaks in system. Have any leaks repaired by qualified personnel.

9.2 Air Removal

When the hydraulic system is operated for the first time, air will be trapped in the components. Use the following procedure to purge this air from the system:

- Lay the jacks on their sides so that the couplers are facing up. Fully extend and retract the jacks several times, until operation is smooth. Do this with no load on the jacks and with the pump positioned higher than the jacks.
- When jacks advance and retract smoothly and without hesitation, the air has been vented from the system. Fully retract the jacks after completing this procedure.

NOTICE Trapped air purged from system components will be returned to the reservoir. Reservoir oil level may drop. If oil level is low after purging air, add additional oil to reservoir as required.

10.0 OPERATION

10.1 Cribbing block Requirements

⚠ WARNING Cribbing blocks must be of sufficient strength to support the load and must be of the proper size and material. Failure to observe the following instructions and precautions may result in failure of the cribbing blocks. An unstable load condition, and loss of load could occur. Death or serious personal injury could result.

Before beginning the lift, ensure that the cribbing blocks to be used meet the necessary requirements for your jack model:

- Models BLS-506 and BLS-1006: Use only Azobe hardwood blocks of strength grade D70 (NEN6760).
- To prevent possible splintering, deformation or cracking, surface pressure must not exceed 13.5N/mm² when using Azobe wood blocks.
- Models BLS-1506 and BLS-2006: Use only solid aluminum or steel blocks with these jack models.

NOTICE Cribbing blocks are **not** included with the BLS Series jacks and are to be supplied by the user. Refer to sections 3.1 and 3.2 for required cribbing block dimensions. Be certain that a sufficient quantity of cribbing blocks of the proper material and size are available to complete the lift.

10.2 Preparing for the Lift

⚠ WARNING

Failure to observe the following instructions and precautions may result in failure of the cribbing blocks. An unstable load condition, and loss of load could occur. Death or serious personal injury could result.

- Before beginning the lift, consult with a qualified and experienced lifting engineer to review the cribbing plan and to ensure the ground conditions are adequate for the load being lifted. Use jacks only on a solid and level surface, capable of supporting the load.
- Determine the maximum ground pressure before beginning the lift. If the ground is not solid, it may deform when lifting begins. Instability of the cribbing blocks and possible loss of load could occur. Refer to Section 10.3 for jack contact pressure information.
- Consult a qualified and experienced lifting engineer to determine the maximum allowable cribbing height for your application.
- If using a single BLS Series Jack, be sure to center the load on the tilting saddle of the jack.
- Distribute the load evenly when performing lifts with multiple jacks. Failure to heed this warning may cause loss of load and/or failure of the jacks.
- Be aware of external events and acts of nature (wind, storms, flooding, earthquakes or other seismic activity, etc.) that could occur while the jack is in active use or when the load is supported by cribbing. Do not use the jack if it is likely that such conditions will occur.

10.3 Contact Pressure

Refer to Table 1 for contact pressure information specific to each BLS Series jack model. This information must be supplied to the lifting engineer and any other persons involved in planning and/or supervising the lift.

The contact pressure is based on the nominal rated load applied to the jack plunger end plate and base plate. This measurement is used to determine the force being transferred to the cribbing blocks and to the ground or other support surface below.

Before the lift is begun, the lifting engineer must determine the maximum contact pressure that the ground can withstand at each lifting point.

⚠ WARNING

If any doubt exists regarding whether the ground or floor can safely support the load to be lifted, the jack(s) should not be used in that location. Consult a qualified professional, such as a licensed civil engineer or building architect. If there are any questions or concerns regarding support surface pressure requirements. Failure to observe this instruction may cause an unstable lifting arrangement, resulting in loss of load, personal injury and/or property damage.

A suitable load spreading plate (user-supplied) of steel or concrete material should be placed under each BLS jack, between the ground and the jack. During the lift, the spreading plate will help to uniformly distribute the pressure transferred to the ground by the jack and cribbing blocks.

- The material and dimensions of the load spreading plates are to be determined by a qualified and experienced lifting engineer.
- Before beginning the lift, check the elevation of each load spreading plate and make sure that all plates are at the same height.
- At the beginning of the lift, extend the cylinder plungers to one-half full stroke. At each jack, check for any deformation of the load spreading plate and ground.
- If ground is unstable and/or settling under any of the jacks, provide adequate ground reinforcement before continuing with the lift. As needed, install spacer plates under the lowest jacks as required, so that all jacks are positioned at the same height. These actions must be performed in accordance with guidance and instructions provided by the lifting engineer.
- After verifying that the ground is stable and capable of supporting the load, the lift can be continued.

10.4 Stage Lifting Procedures

⚠ WARNING Read and understand all safety precautions in sections 2.1 and 2.2 of this manual before proceeding with lifting or lowering. Also refer to the additional safety information in sections 10.1, 10.2 and 10.3. Failure to follow the precautions and instructions contained in these sections may result in death or serious personal injury.

NOTICE The exact procedures used for lifting and lowering will vary, depending on the hydraulic power source, number of lifting points, total lifting height, load characteristics, and other factors. Use the procedures in sections 10.4.1 and 10.4.2 only as a guide. It is assumed that multiple jacks will be used.

NOTICE The hydraulic cylinder contains an internal stop ring to prevent over-extension of the cylinder rod. However, to reduce cylinder wear, use less than full stroke and pressure whenever possible.

10.4.1 Lifting the Load

Lift the load as described in the following steps. Refer to Figure 4, views “A”, “B”, “C” and “D” for reference.

1. Position the jacks under the load at each lifting point. Place load spreading plates under each jack (refer to Section 10.3 for additional information). Be certain that the cylinder plungers are fully retracted. See Figure 4, View A.
2. After all jacks are in position, extend the cylinder plungers **one-half stroke**. Verify that the load is being lifted evenly by the jacks.
3. At each jack, check for any deformation of the load spreading plate and ground. Refer to Section 10.3 for additional information.

⚠ WARNING If deformation of load spreading plates or ground is noticed, stop lifting immediately and take corrective action before continuing. Death or serious personal injury could occur if the ground settles or collapses and loss of load occurs.

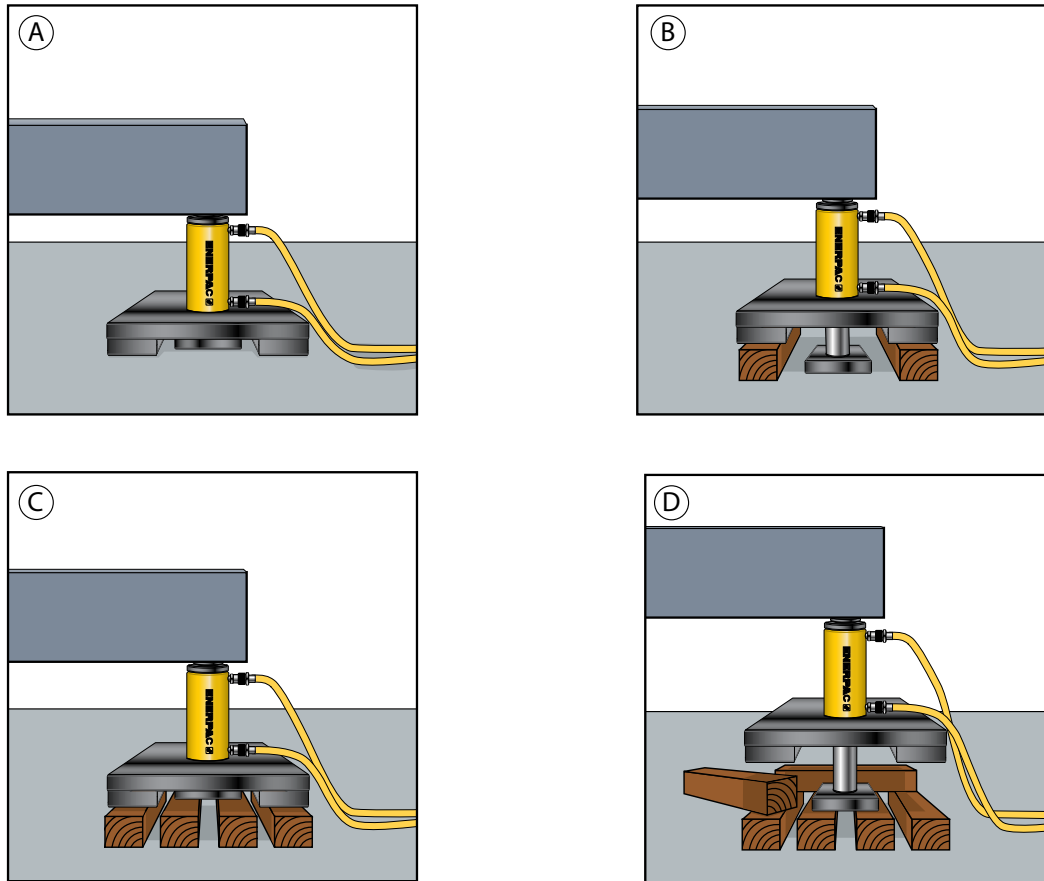
4. Extend the cylinder plungers an additional amount to provide sufficient clearance for cribbing block installation. At each jack, insert two outer cribbing blocks under the jack base plate. See Figure 4, View B.
5. Slowly retract the cylinder plungers until the load is fully supported by the cribbing blocks.
6. At each jack, check for any deformation of the cribbing blocks, load spreading plate and ground. Verify that the load is being lifted evenly. Refer to Section 10.3 for additional information.

⚠ WARNING If deformation of cribbing blocks, load spreading plate or ground is noticed, stop lifting immediately and take corrective action before continuing. Deformations due to ground settling and compression of cribbing materials could affect alignment of the load. Death or serious personal injury could occur if cribbing blocks become unstable, and loss of load occurs.

7. Fully retract the cylinder plungers to provide clearance under the plunger end plates.
8. At each jack, insert two inner cribbing blocks under the plunger end plate. See Figure 4, View C.
9. Extend the cylinder plungers and lift the load a sufficient amount to provide clearance for the next set of outer cribbing blocks to be installed.

Table 1 - Contact Pressure Information - BLS Series Climbing Jacks

Model No.	Jack Base Plate Area		Jack Plunger End Plate Area		Lifting Force		Pressure at Jack Base Plate		Pressure at Jack Plunger End Plate	
	mm ²	in ²	mm ²	in ²	kN	tons	Kg/cm ²	psi	Kg/cm ²	psi
BLS-506	52400	81.22	57500	89.13	498	56	96.90	1378	88.3	1256
BLS-1006	95600	148.18	107800	167.10	933	105	99.40	1414	88.2	1255
BLS-1506	48000	74.40	52800	81.84	1386	156	294.40	4188	267.7	3807
BLS-2006	67300	104.32	72800	112.84	1995	224	301.80	4293	279.4	3974



NOTICE Load spreading plate is not shown, but may be necessary in certain conditions. Refer to Section 10.3.

Figure 4, Stage Lifting Sequence - BLS Series Climbing Jack

10. At each jack, insert two *new* outer cribbing blocks under the jack base plate, placing them *crosswise* over the cribbing blocks previously installed in steps 4 and 8. See Figure 4, View D.
11. Slowly retract the cylinder plungers until the load is fully supported by the cribbing blocks.
12. At each jack, check again for any deformation of the cribbing blocks, load spreading plate and ground. Verify that the load is being lifted evenly. Refer to Section 10.3 for additional information.
13. Fully retract the cylinder plungers to provide clearance under the plunger end plates.
14. At each jack, insert two *new* inner cribbing blocks under the plunger end plate.
15. Repeat steps 2 through 14 as required, until the desired lifting height is achieved.

At each lifting point, after each lifting cycle is completed:

- Check for deformation of the jack support surface.
- Check for deformation of the cribbing blocks.
- Verify that cribbing blocks remain aligned and that they are not sliding out of position. Cribbing block column must be perpendicular to the ground, not tilted or leaning.
- Verify that the load is being lifted evenly.

10.4.2 Lowering the Load

Lower the load as described in the following steps:

1. Extend the cylinder plungers slightly to provide clearance under the jack base plates, so that the outer cribbing blocks can be removed.
2. At each jack, remove the two outer cribbing blocks located immediately under the jack base plate.
3. Slowly retract the cylinder plungers until the jack base plates are supported by the next lowest set of outer cribbing blocks.
4. Fully retract the cylinder plungers to provide clearance under the plunger end plates, so that the inner cribbing blocks can be removed.
5. At each jack, remove the two inner cribbing blocks located immediately under the plunger end plate.
6. Repeat steps 1 through 5 until the load is fully lowered.

11.0 RELIEVING TRAPPED PRESSURE

Pressure can sometimes become trapped in a hydraulic jack if a hose is disconnected before pressure is completely relieved.

If a trapped pressure condition occurs, always use the Enerpac model CT-604 coupler bleed tool (available from your Enerpac distributor) to safely relieve the remaining pressure.

⚠ WARNING Never attempt to relieve hydraulic pressure by loosening a coupler. Trapped hydraulic pressure can cause a loosened coupler to dislodge unexpectedly with great force. Serious personal injury or death will result if the coupler becomes a projectile and strikes persons working in the area.

⚠ WARNING Loosening a coupler may result in an escape of high pressure oil that can penetrate the skin. Serious personal injury or death could result.

⚠ WARNING Never use a hammer and punch (or other similar method) to unseat a coupler check ball that is under pressure. Serious personal injury or death could result due to the sudden and uncontrolled escape of high pressure oil.

12.0 MAINTENANCE

1. Use only Enerpac HF hydraulic oil (ISO 32) with the BLS Series jacks. Enerpac HF oil is available from your Enerpac distributor or authorized service center.
2. Install dust caps and plugs when the jack is disconnected from the hydraulic hoses.
3. Keep the jack exterior surfaces clean. Remove any loose dirt.
4. Keep the cylinder plunger surface clean. An internal wiper is designed to help maintain plunger cleanliness and prevent dirt entry. However, an accumulation of dirt on the plunger surface over a long period of time may damage the cylinder seal system.
5. Store the jack with the cylinder plunger fully retracted. When the jack has not used for a period of 30 days, it should be connected to a pump and fully retracted and extended a minimum of 5 times. This cycle will lubricate and keep clean the plunger surface.
6. Inspect the external painted areas of the jack. If any paint damage is visible, repaint the damaged areas using proper procedures.

13.0 TROUBLESHOOTING

Refer to the troubleshooting guide when diagnosing jack 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 common possible problems.

For repair service, contact your nearest Enerpac Authorized Service Center. Only an Enerpac Authorized Service Center should service the jack and its components.

As required, also refer to the troubleshooting information provided with your hydraulic pump or power unit.

⚠ WARNING

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

- Never tighten or loosen hydraulic fittings while the hydraulic system or connected components are pressurized. Escaping oil under pressure can penetrate the skin, causing serious personal injury.
- Keep hands, fingers and other body parts clear of pinch points and moving parts when observing operation during troubleshooting.
- To prevent accidental start-up of pump during servicing, always disconnect power before performing any maintenance or repair procedures.

Table 2 - Troubleshooting Chart

Symptom	Possible Cause	Solution
1. Jack will not advance.	a. Directional control valve not in proper position.	Shift directional control valve to proper position.
	b. Coupler not fully tightened.	Tighten coupler.
	c. Pump oil level is low.	Add oil to pump reservoir as required.
	d. Pump malfunctioning.	Repair or replace pump as required.
	e. Load is too heavy for jack.	Use a jack with a higher load rating.
	f. Cylinder seals leaking.	Repair or replace cylinder.
2. Jack advances 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. Jack advances in spurts.	a. Air in hydraulic system.	Remove air from hydraulic system. See Section 9.2.
	b. Cylinder plunger binding.	Repair or replace cylinder.
4. Jack advances slower 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. Jack advances, 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 jacks.
	d. Cylinder seals leaking.	Repair or replace cylinder.
6. Jack 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.

Enerpac Worldwide Locations

◆ e-mail: info@enerpac.com

◆ internet: www.enerpac.com

Australia and New Zealand

Actuant Australia Ltd.
P.O. Box 6867
Wetherhill Park, NSW1851
Block V Unit 3
Regents Park Estate
391 Park Road
Regents Park NSW 2143
Australia
T +61 287 177 200
F +61 297 438 648
sales-au@enerpac.com

Brazil

Power Packer do Brasil Ltda.
Rua Luiz Lawrie Reid, 548
09930-760 - Diadema (SP) - Brazil
T +55 11 5687 2211
Toll Free: 0800 891 5770
vendasbrasil@enerpac.com

China (Taicang)

Actuant (China) Industries Co. Ltd.
No.6 Nanjing East Road,
Taicang Economic Dep Zone
Jiangsu, China
T +86 0512 5328 7500
F +86 0512 5335 9690
Toll Free: +86 400 885 0369
sales-cn@enerpac.com

France, Switzerland, North Africa and French speaking African countries

ENERPAC
Une division d'ACTUANT France S.A.S.
ZA de Courtaboeuf
32, avenue de la Baltique
91140 VILLEBON /YVETTE
France
T +33 1 60 13 68 68
F +33 1 69 20 37 50
sales-fr@enerpac.com

Germany and Austria

ENERPAC GmbH
P.O. Box 300113
D-40401 Düsseldorf
Willstätterstrasse 13
D-40549 Düsseldorf, Germany
T +49 211 471 490
F +49 211 471 49 28
sales-de@enerpac.com

India

ENERPAC Hydraulics (India) Pvt. Ltd.
No. 10, Bellary Road, Sadashivanagar,
Bangalore, Karnataka 560 080
India
T +91 80 3928 9000
info@enerpac.co.in
www.enerpac.com

Italy

ENERPAC S.p.A.
Via Canova 4
20094 Corsico (Milano)
T +39 02 4861 111
F +39 02 4860 1288
sales-it@enerpac.com

Japan

Applied Power Japan LTD KK
Besshocho 85-7
Kita-ku, Saitama-shi 331-0821, Japan
T +81 48 662 4911
F +81 48 662 4955
sales-jp@enerpac.com

Middle East, Egypt and Libya

ENERPAC Middle East FZE
Office 423, LOB 15
P.O. Box 18004, Jebel Ali, Dubai
United Arab Emirates
T +971 (0)4 8872686
F +971 (0)4 8872687
sales-ua@enerpac.com

Russia

Rep. office Enerpac
Russian Federation
Admiral Makarova Street 8
125212 Moscow, Russia
T +7 495 98090 91
F +7 495 98090 92
sales-ru@enerpac.com

Southeast Asia, Hong Kong and Taiwan

Actuant Asia Pte Ltd.
83 Joo Koon Circle
Singapore 629109
T +65 68 63 0611
F +65 64 84 5669
Toll Free: +1800 363 7722
sales-sg@enerpac.com

South Korea

Actuant Korea Ltd.
3Ba 717, Shihwa Industrial Complex
Jungwang-Dong, Shihung-Shi,
Kyunggi-Do
Republic of Korea 429-450
T +82 31 434 4506
F +82 31 434 4507
sales-kr@enerpac.com

Spain and Portugal

ENERPAC SPAIN, S.L.
Avda. Los Frailes, 40 – Nave C & D
Pol. Ind. Los Frailes
28814 Daganzo de Arriba
(Madrid) Spain
T +34 91 884 86 06
F +34 91 884 86 11
sales-es@enerpac.com

Sweden, Denmark, Norway,

Finland and Iceland
Enerpac Scandinavia AB
Kopparlundsvägen 14,
721 30 Västerås
Sweden
T +46 (0) 771 41 50 00
scandinavianinquiries@enerpac.com

The Netherlands, Belgium, Luxembourg, Central and Eastern Europe, Baltic States, Greece, Turkey and CIS countries

ENERPAC B.V.
Galvanistraat 115, 6716 AE Ede
P.O. Box 8097, 6710 AB Ede
The Netherlands
T +31 318 535 911
F +31 318 535 848
sales-nl@enerpac.com

Enerpac Integrated Solutions B.V.

Spinelstraat 15, 7554 TS Hengelo
P.O. Box 421, 7550 AK Hengelo
The Netherlands
T +31 74 242 20 45
F +31 74 243 03 38
integratedsolutions@enerpac.com

South Africa and other English speaking African countries

Enerpac Africa Pty Ltd.
No. 5 Bauhinia Avenue
Cambridge Office Park
Block E
Highveld Techno Park
Centurion 0157
Republic of South Africa
T: +27 12 940 0656
sales-za@enerpac.com

United Kingdom and Ireland

ENERPAC UK Ltd.
5 Coopies Field
Morpeth, Northumberland
NE61 6JR, England
T +44 (0) 1670 5016 50
F +44 (0) 1670 5016 51
sales-uk@enerpac.com

USA, Latin America and Caribbean

ENERPAC World Headquarters
P.O. Box 3241
Milwaukee WI 53201-3241 USA
N86 W12500 Westbrook Crossing
Menomonee Falls, Wisconsin 53051
T +1 262 293 1600
F +1 262 293 7036
User inquiries:
T +1 800 433 2766
Distributor inquiries/orders:
T +1 800 558 0530
F +1 800 628 0490
Technical inquiries:
techservices@enerpac.com
sales-us@enerpac.com

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guaranteed against defects
in workmanship and materials
for as long as you own them.

For the location of your nearest
authorized Enerpac Service Center,
visit us at www.enerpac.com