

SAFE USE OF HYDRAULIC CYLINDERS

Applies to: Hi-Force, Enerpac, Tangye and similar hydraulic cylinders, jacks, and pumps

Purpose

Hydraulic cylinders provide controlled lifting, pushing, pulling, or pressing force for heavy machinery, structures, and engineering tasks.

They deliver high force output from a compact unit when used with manual, electric, air, or petrol-driven pumps.

This leaflet provides guidance for safe setup, operation, and maintenance to prevent overloading, hose failure, hydraulic leaks, or unstable lifts.

Before Use

- Inspect cylinder – Check body, piston, saddle, threads, and return mechanism for damage, scoring, or leaks.
- Verify tonnage rating – Ensure the cylinder's capacity (tonnes) exceeds the load being lifted or pushed.
- Check stroke length – Confirm the required lift does not exceed the cylinder's maximum stroke.
- Check hydraulic pump – Inspect pump body, handle, motor, reservoir level, and pressure gauge.
- Inspect hoses & couplers – Look for cracks, abrasion, blistering, cuts, corrosion, or leaking fittings.
- Confirm compatibility – Ensure all components (pump, cylinder, hose, coupler) share the same **pressure rating**, typically 700 bar / 10,000 psi.
- Check base stability – Cylinder must sit on a solid, level surface using a steel plate or jacking block if required.
- Inspect saddle – Ensure correct saddle is fitted and contact surfaces are clean and centred.
- Confirm load path – The load must be vertical and directly aligned with the cylinder; no side-loading.
- Do a function test – Pressurise lightly with no load to check movement and valve operation.
- Ensure operator competence – Only trained persons should assemble and operate hydraulic equipment.

During Operation

- Position cylinder centrally under the load with full base contact.
- Use suitable jacking blocks, cribbing, or steel plates to ensure stability.
- Pump slowly and evenly — avoid shock loading.
- Keep hands and body clear of the load path and pinch points.
- Monitor pressure gauge regularly to avoid overload.
- Use tilt saddles or specialist cylinders if misalignment cannot be avoided.
- If using multiple cylinders:
 - Use a manifold for equalised flow
 - Maintain synchronised lifting at all points
- Check hoses remain straight, supported, and protected from crushing or sharp edges.
- Never work under a load supported only by a hydraulic cylinder — always use mechanical supports.
- Stop immediately if you see leaks, hear hissing, or notice jerky piston movement.

Do Not

- Exceed the rated pressure or tonnage capacity.
- Use damaged hoses, couplers, or cylinders.
- Side-load or force the cylinder at an angle.
- Use cylinders as structural supports — they are not designed to hold static loads.
- Weld, heat, or modify the cylinder or ram.
- Use PTFE tape on hydraulic fittings — use proper sealing surfaces only.
- Unscrew couplers under pressure.
- Allow hoses to become kinked, crushed, or tensioned.
- Lift people or allow personnel beneath unsupported loads.

After Use

- Lower the load fully using the release valve or pump return.
- Depressurise the system before disconnecting hoses.
- Clean cylinder and hose threads using a lint-free cloth.
- Inspect for leaks, damaged seals, and worn saddles.
- Replace dust caps on all couplers to prevent contamination.
- Store vertically with ram fully retracted.
- Maintain accurate inspection and pressure test records.

Safety Reminders

- Always follow manufacturer instructions (Hi-Force, Enerpac, etc.).
- Maintain good housekeeping around hydraulic equipment.
- Ensure cylinders are fully supported with stable cribbing before going under loads.
- Never exceed 700 bar/10,000 psi systems unless designed for it.
- Perform pre-use checks before each shift.
- Wear correct PPE: gloves, helmet, safety boots, and eye protection.
- Have hydraulic equipment periodically inspected by a competent person.

Support and Maintenance

For service, inspection, and spare parts, contact your local Lifting Gear and Safety Depot

Depot List

Bristol: 0117 9714883

Avonmouth: 0117 9550456

Newport: 01633 334450

Port Talbot: 01639 540007

Pembroke: 01646 574000

Plymouth: 01752 474488

Fareham: 01329 550988

Redruth: 01209 703990