Abdex
HYDRAULICS

Abdex Hydraulics Safety Training

700 Bar Hydraulic Jacking Equipment & Tools

Bolting Equipment

Heavy Vehicle Jacks

Abdex HYDRAULICS

MAMMUT

YAK

EUROPRESS

Key Facts – Abdex Hydraulics

- Abdex is a family owned & run business founded in 1974.
- Operations in Victoria, Western Australia, New South Wales, Queensland & the United Kingdom.
- Businesses in Australia include Abdex Industries, Abdex Hydraulics & Abdex Auto Tools (Karmot)
- Abdex Hydraulics focuses on high pressure hydraulic equipment and tools
- Established in Australia in 2005, originally as Larzep Australia. Rebranded to Abdex Hydraulics in 2024
- Exclusively sells high quality European brands Euro Press Pack (EPP), Mammut & Yak as well as our own Abdex Hydraulics products

Purpose of This Training

- Develop or enhance your understanding of High Pressure Hydraulic Equipment
- Ensure you know the risks & best practices for working with 700bar hydraulic tools
- Select the right alternatives / combinations of products for the application
- Increase safety & awareness of the dangers of high pressure hydraulic equipment

Abdex Hydraulics Product Catalogues

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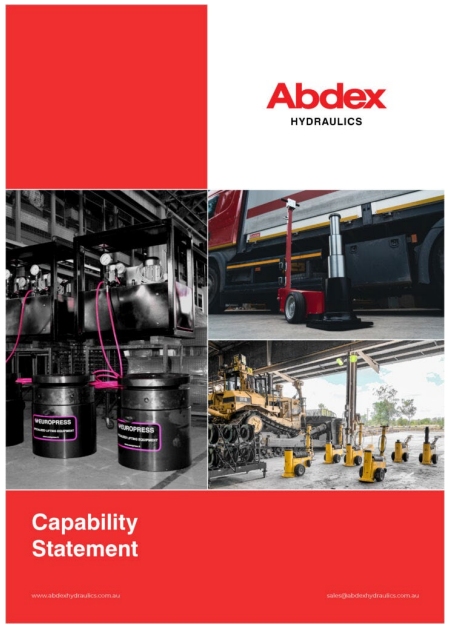

Catalogue Technical Information

- What can you find in the Technical Information pages ?

  - Safety instruction
  - Cylinder & Pump selection
  - Basic system set-ups
  - Basic hydraulics
  - Unit converter
  - Valves information
  - Etc, etc, etc.....

Website

- www.abdexhydraulics.com.au
  www.mammut.com.au / www.yakjacks.com.au
    - Up to date products always

- You can:
    - Ask for a quotation
    - E-mail catalogue pages to customers
    - Find the closest distributor
    - See our latest product developments

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Components of a Hydraulic System

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Components of a Hydraulic System

- Tool (cylinder, machine lifter, cutter, etc.)
- Pump (hand pump, electric pump, etc.)
- Hose
- Male Coupler

Always offer a gauge to ensure a safe working environment. The gauge is the “window” into your system.

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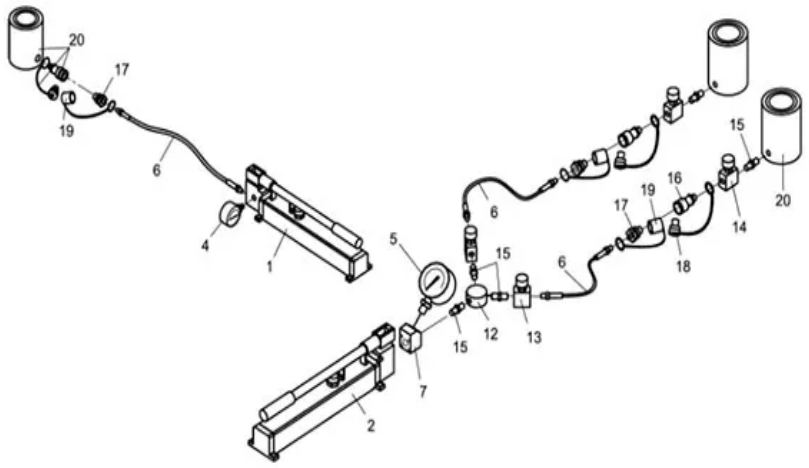
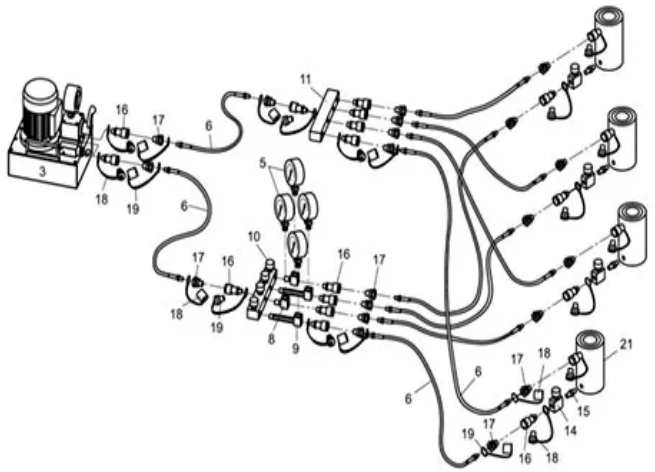
Components of a Hydraulic System





1 Hand pump with side mounted gauge
2 Hand pump with front mounted gauge
3 Power pack
4 G106L gauge
5 G10 gauge
6 SN# hose, 3/8" NPT
7 ZPF12 gauge adapter (flange connection)
8 RP50 gauge block
9 RP502 gauge block
10 VRF384 four-way needle valve
11 RM387 Manifold
12 RK383 radial manifold
13 VRF38 needle valve
14 VRU38 flow control valve
15 RN38 nipple
16 K73F female coupler
17 K73M male coupler
18 K73C female dust cap
19 K73D male dust cap
20 K73D male dust cap
21 Double-acting cylinder

It's important to drop the pressure inside the cylinder before disconnecting the quick coupler to avoid problems if re-inserting or lowering the load.

In case some pressure persists it is possible to use the apposite tool KTS38.

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Three Main Types of Cylinders

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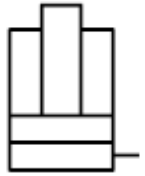
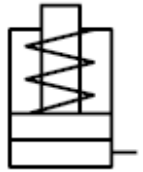


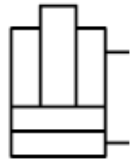
LOAD RETURN

Load return, in which the piston is retracted by the weight of the load (or any other external force). The minimum force required to retract the piston is approximately 0.2% of the rated cylinder nominal push value. These cylinders are the most economic solution for an application that does not require quick removal of the cylinder after the load has been lowered.



SPRING RETURN

Spring assisted return, in which the piston is retracted by means of an internal compression or a tension spring inside the cylinder. These cylinders are proposed whenever it is necessary to remove the cylinder quickly once the load has been lowered.



OIL RETURN

Oil Return, (double acting): the piston is retracted hydraulically by pumping oil into the top chamber of the cylinder. The ideal usage of these cylinders is in production applications where a fast cycle time is required. When being used in a lifting application, the lowering of the load can be controlled by adding a pilot check valve and one-way flow distributor into the circuit. The return pressure can be set to a lower value when it is required to only retract the piston.

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Single Acting Cylinder Vs Double Acting Cylinder

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CMI Single acting cylinders spring return

- Force: 5-100t
  Stroke: 25-325mm
  Max working pressure: 700bar
- All the CMI cylinders have collar threads on the cylinder body and mounting holes in the base.
- These cylinders can be operated in any position and are extremely versatile and suitable for different applications, including industrial works, steel structural works, presses and special applications. The nitride treatment gives these cylinders an excellent resistance to corrosion and makes them particularly suitable to operate in the open air or in aggressive environments.

Pumps - Single acting using One hose

COI Double acting cylinders oil return

- Force: 10-500t
  Stroke: 150-325mm
  Max working pressure: 700bar
- All the COI cylinders have collar threads on the cylinder body and mounting holes in the base.
- These cylinders are supplied with an interchangeable grooved saddle and models over 30 tonne have eyelets to facilitate their transport. For models with 30 ton or higher, the hole in the rod is not suitable for traction but only for the mounting of tilt saddles or other equipment. A safety valve connected to the retract chamber avoids any possible overpressure. The guide nut has a wiper ring to prevent the entering of dirt and to extend the working life of the cylinder.

Pumps – Double acting using two hoses

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Cylinder Selection

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Questions to ask:

- Capacity in tonnes? (metric) Please mention the 80% rule
- What's the application? (surface, load, frequency, temperature)
- Max. closed height?
- What stroke is required?
- S/A or D/A (high cycle, speed, pulling, upside down)
- How many cylinders are needed? (if more than one, what's the distance in between)
- Is load holding required?
- Do the cylinders have to work simultaneously
- Is side load relevant? (Do you need tilting saddles)

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Cylinder selection

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Single Acting Spring Return Cylinder

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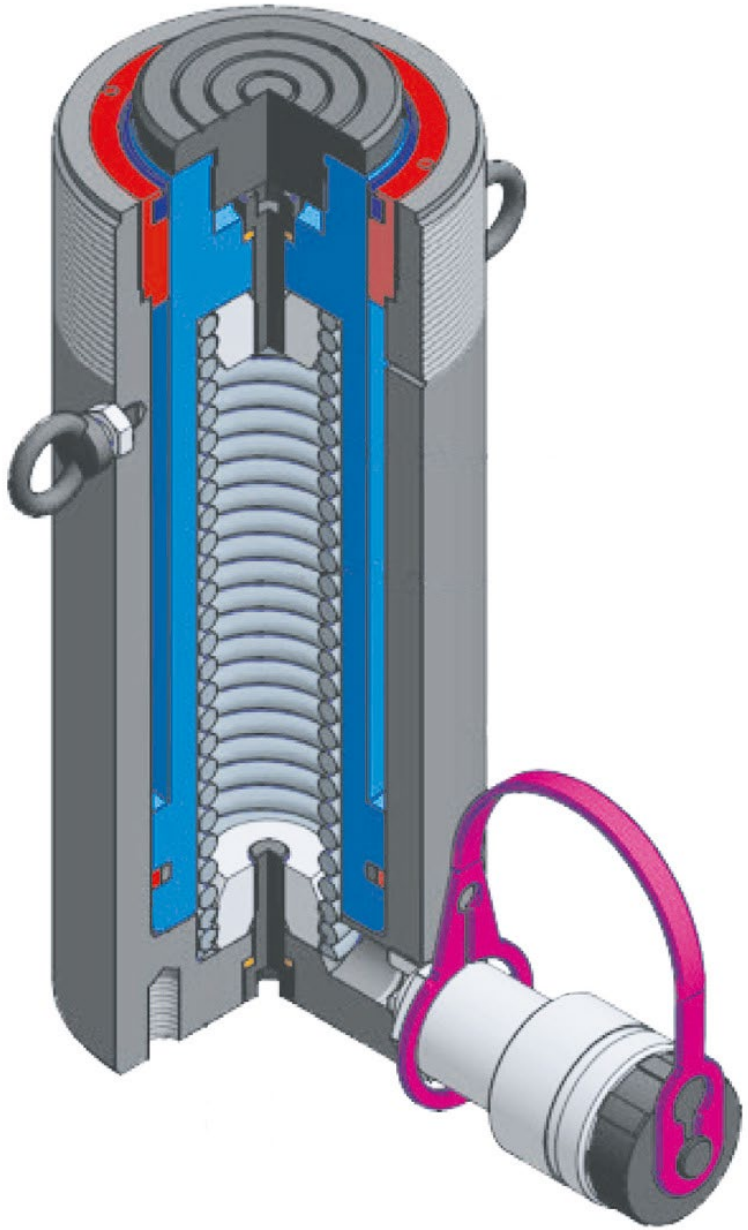

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Pump selection

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Pump selection

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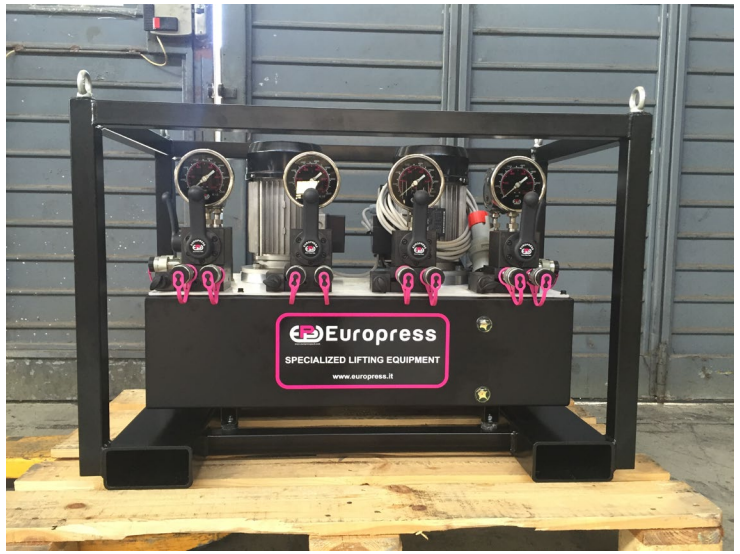
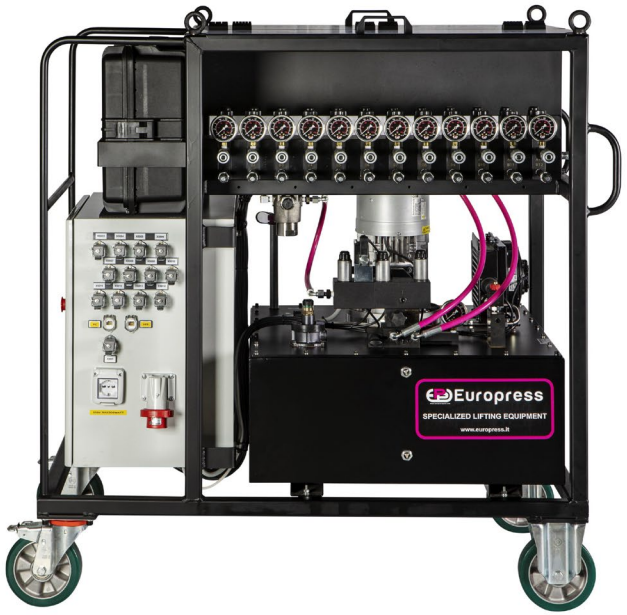
- Hand Operated
- Air Operated
- Battery & Petrol Pumps, perfect for isolated environments
- Electric powerpacks
- Single or double acting
- Split Flow or Synchronised Lift





Pascals Law

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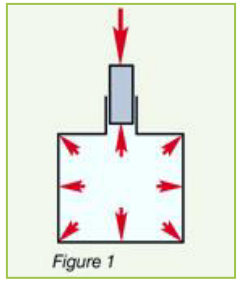
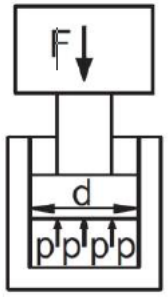
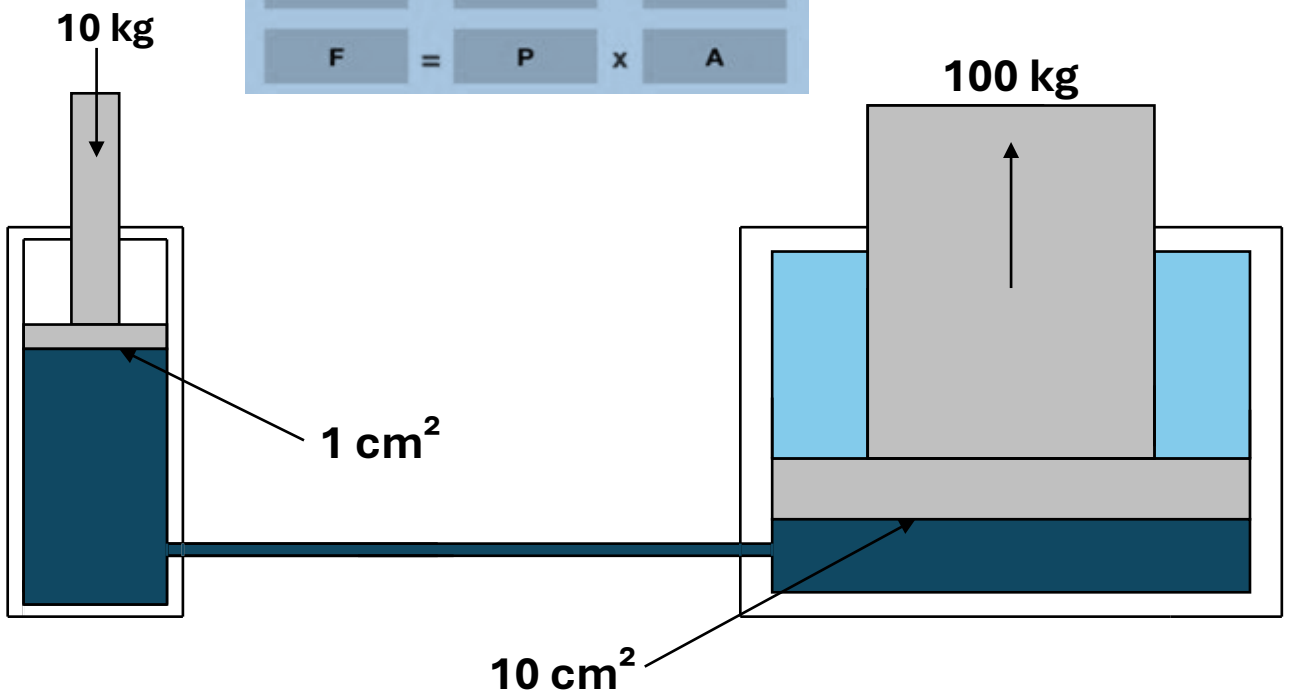




Force	=	Hydraulic Working Pressure	x	Cylinder Effective Area
F	=	P	x	A

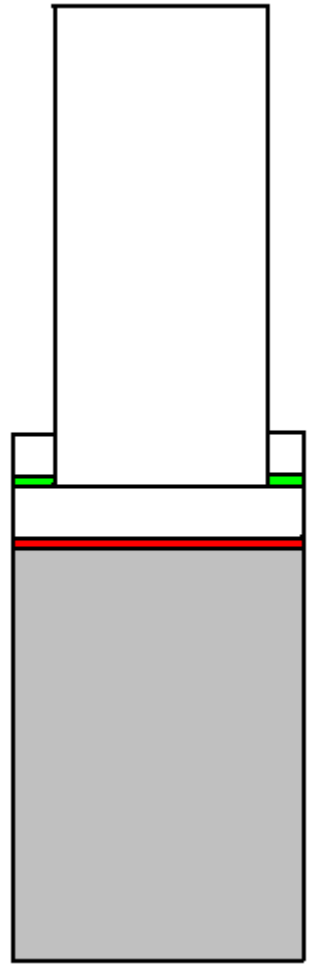


The force of a hydraulics cylinder, comes from the pressure on the piston diameter

Pascals Law

Question: why is the **pulling** force on a double acting cylinder lower than the **pushing** force, while the pressure is the same ?

Force	=	Hydraulic Working Pressure	x	Cylinder Effective Area
F	=	P	x	A



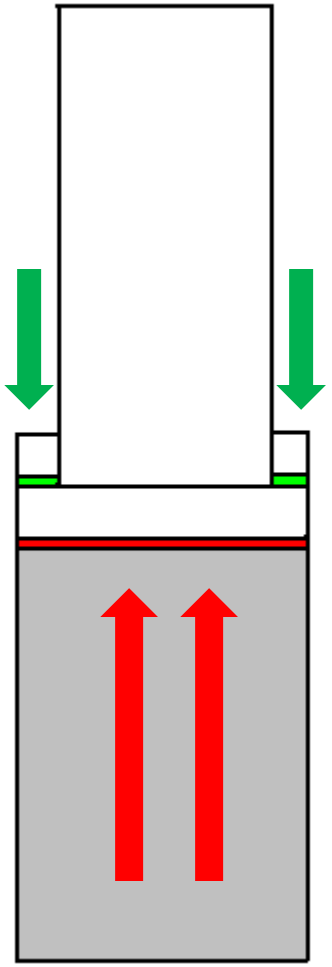
Pascals Law

Question: why is the **pulling** force on a double acting cylinder lower than the **pushing** force, while the pressure is the same ?

Answer:

Because the “Area” on the **pulling** side is smaller than the “Area” on the **pushing** side

Force	=	Hydraulic Working Pressure	x	Cylinder Effective Area
F	=	P	x	A



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Cylinder Safety

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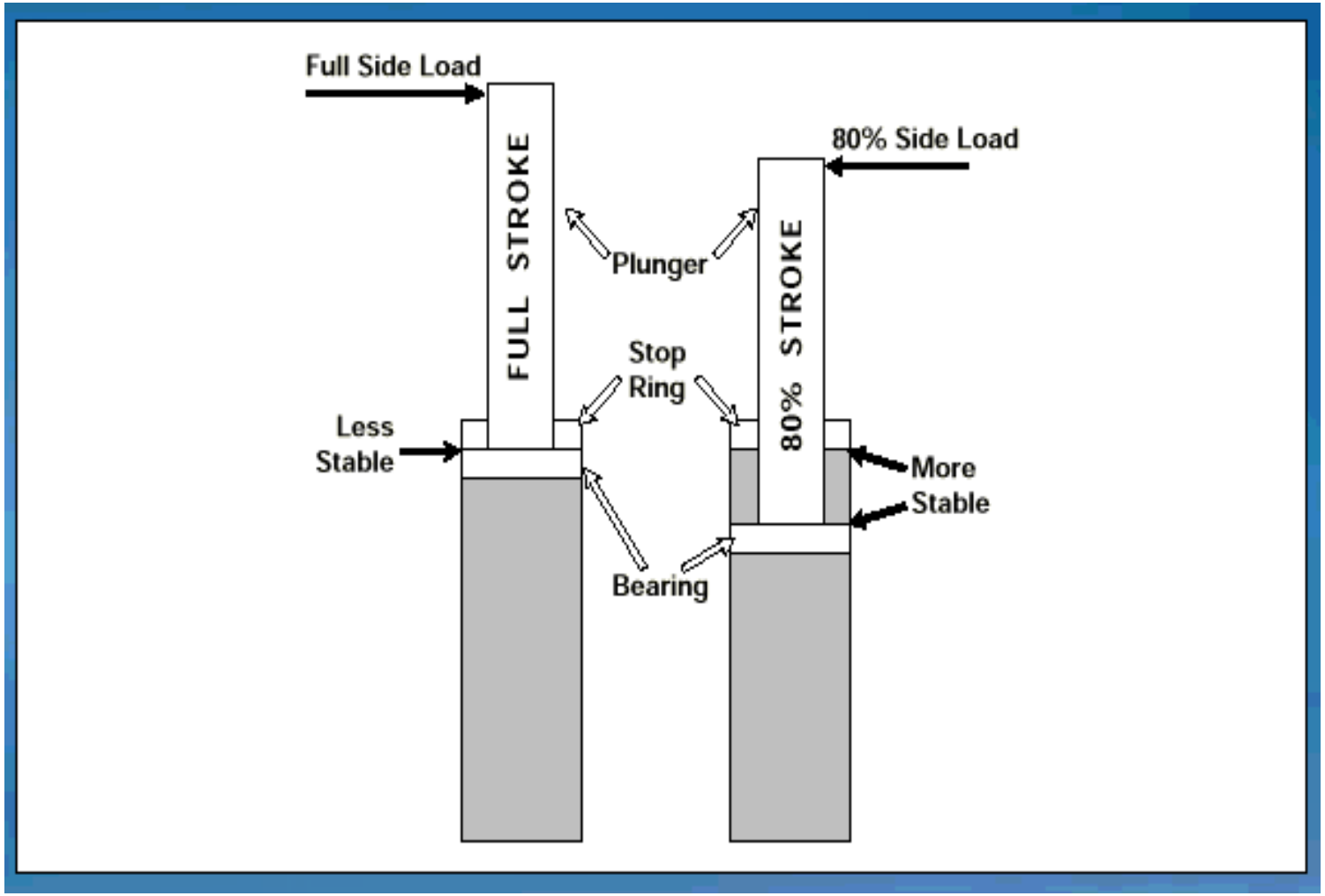

Cylinder Safety

- Abdex products are rated at maximum capacity for safe use.
- Good practice is to use the products at 80% of their rated capacity
- The remaining 20% helps to prevent possible safety issues during unexpected circumstances

Instructions

We recommend to carefully read the relevant safety instructions before using products

Cylinders

Always provide a solid support for the entire cylinder surface area, for greater support, use accessories.

Make sure that the two areas that the cylinder generates force are sufficiently strong and non-deformable

Cylinders

Never use a cylinder without a load saddle. They distribute the load evenly and are hardened to prevent damage to the piston

The cylinder saddle must be in contact with the load and the cylinder movement must be in axis with the load movement

Cylinders

To help avoid lifting of off-centred loads which could damage the cylinder, the use of a tilt saddle allows for up to ± 5° misalignment

To hold the load, use a needle or pilot operated check valve. If the load needs to be held for an extended period, use a lock nut cylinder

Cylinders

Never work near a load supported only by hydraulic components

Never place any part of your body under a load held only by hydraulic components, it is essential to support the load mechanically

Cylinders

Keep your hydraulic equipment away from temperatures above 65°C

EPP cylinders are treated against corrosion, nevertheless, in case of applications in extreme or marine environments, please contact us

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NITREG – Our Steel Does Not Corrode

Abdex HYDRAULICS

- All EPP steel cylinders are uniquely manufactured using a Nitreg ONC process which makes the material exceptionally hard and resistant to corrosion. This creates a product perfectly suited for tough Australian conditions.
- EPP has used NITREG for more than 30 years. The process combines nitriding and post-oxidation to transform the surface chemical structure of steel down to every detail. Whether it's a simple shape or a challenging geometry, we ensure uniform treatment and top performance.
- The Nitreg ONC treatment, standard on all our steel products, allows us to deliver quality and exceptional performance in terms of resistance and long-lasting durability across all surfaces, including dynamic contact and connection areas.

- What sets us apart from competitors?
  - Unmatched Resistance: Enhanced by a special oil that impregnates surfaces, making them virtually immune to corrosion.
  - Unbeatable Internal Performance: Perfect even for parts that cannot be painted.
  - Extreme Durability: Successfully withstands over 200 hours in salt spray testing (ASTM B117).
  - Versatility in Extreme Environments: Ideal for marine, aggressive, and high-wear contexts.

- EPP products, recognizable by their distinctive black color, not only pass rigorous testing but also guarantee reliable performance even in critical conditions. With in-house production, high-quality steel, and rapid delivery times, we are able to provide solutions that combine excellence with efficiency.

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NITREG – Our Steel Does Not Corrode

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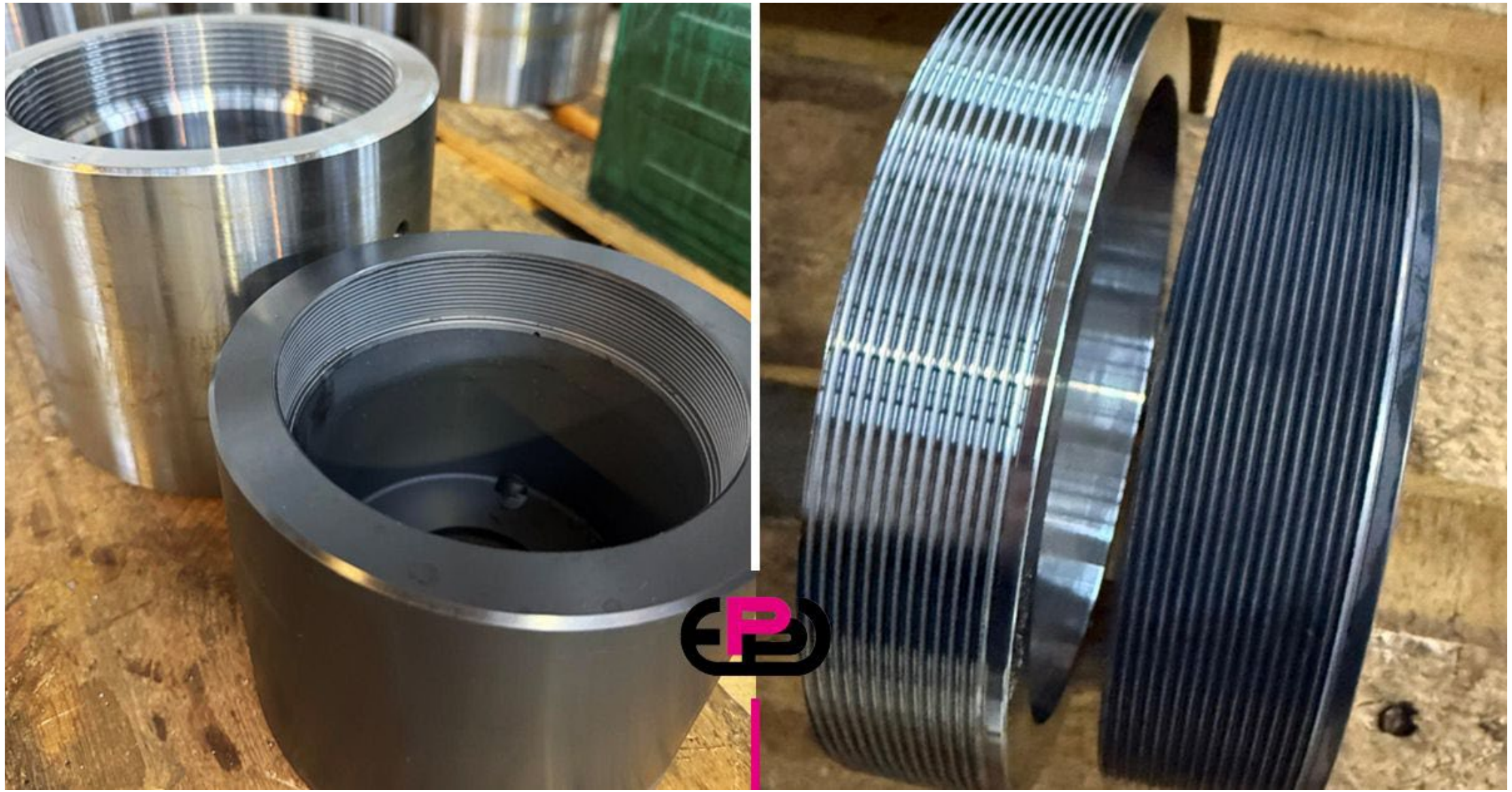

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Cylinders

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- No AS standard in Australia that covers Jacking cylinders / pumps.
- Look for cylinders that comply with ANSI-B30.1

Cylinders

Avoid retracting the piston too quickly if under load, a sudden retraction can create pressure shocks in the system

Do not use a component with a load exceeding their nominal capacity. Always use a gauge

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Hydraulic Hoses & Couplers

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Keep the hoses away from the area under load.

Do not lift any component by the hose.

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Hydraulic Hoses & Couplers

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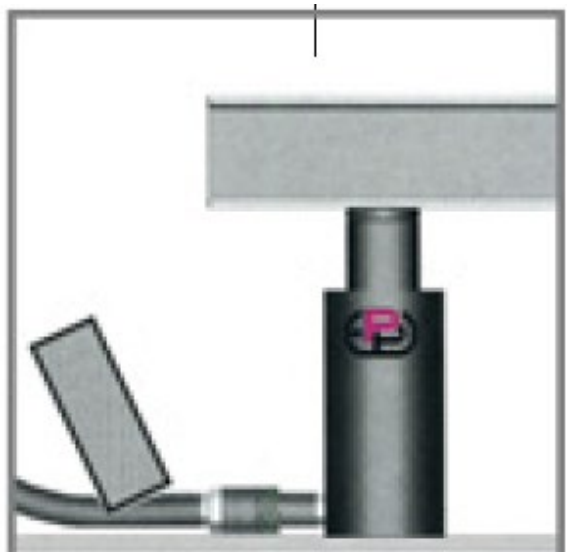
Ensure couplers are clean before connecting. Be sure to fully connect the couplers to allow free oil flow in both directions

Only disconnect the cylinder from the pump when the rod has fully retracted and the pressure inside has been fully released.

Hydraulic Hoses & Couplers



Do not fold hoses, do not exceed the maximum bend radius of the hose and do not walk over or drop heavy objects on them

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Hydraulic Hoses & Couplers

Abdex HYDRAULICS

Thermoplastic Hose: **Safety Factor 4:1**

Bend Restrictor on both ends

3/8”-NPTF thread on each end

REMEMBER: Always discard damaged hoses to eliminate the risk of someone else using the hose. The next user might not notice the damage until the hose is pressurized. A leak in a hose can cause high pressure oil to penetrate your skin. **IF YOU ARE EVER INJURED BY A SPRAY OF OIL, SEE A DOCTOR IMMEDIATELY.**

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Questions about Couplers

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Why do we need couplers in our system ?

For easy use and assembly

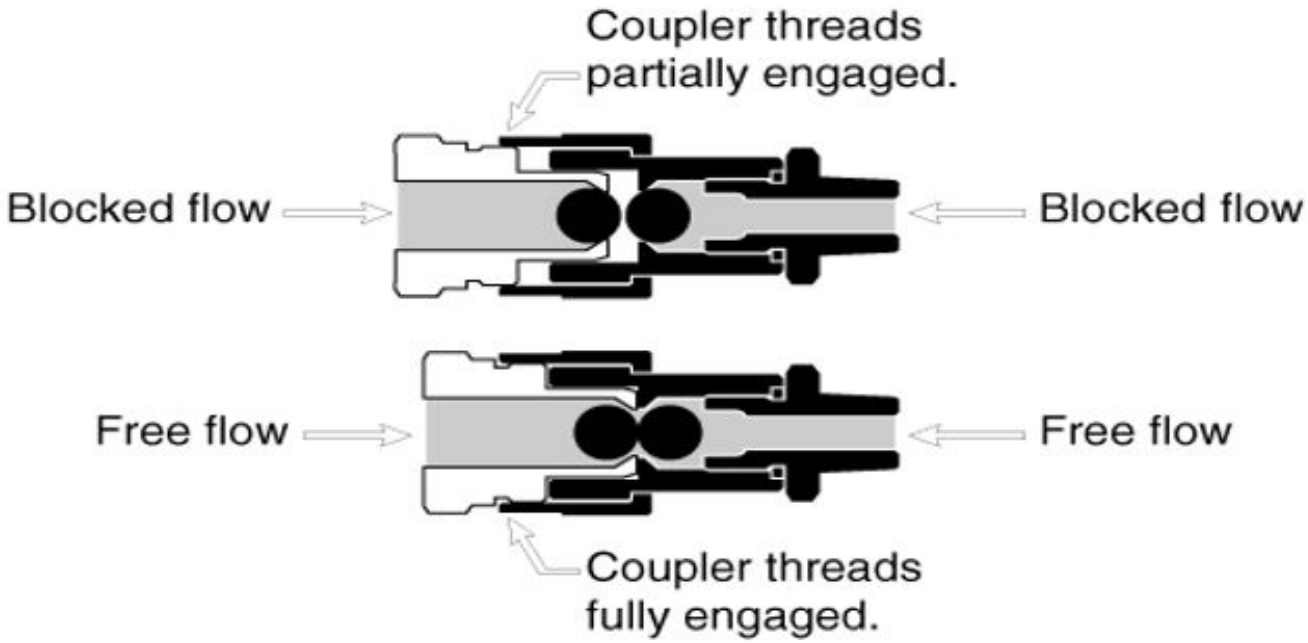
Can we use different brands together ?

Yes, but be sure that they connect together properly to allow correct flow.

Should an un-connected coupler be pressurized?

Best practice not to

Hydraulic Hoses & Couplers



Gauges

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All hydraulic systems should have a gauge. The gauge is the window to the hydraulic system. In addition to indicating the operating pressure, the gauge can also warn you that something is going wrong.
IN A LIFTING SITUATION THE GAUGE WILL READ AS FOLLOWS:
The gauge will not show much of a pressure rise until the cylinder contacts the load.
The pressure will start to rise after the cylinder has contacted the load.
The pressure continues to rise with each pump stroke.
When the load starts to move, the pressure will remain constant. If you continue pumping and the load does not move, you may have reached the end of the cylinder stroke, or part of your setup may be yielding.

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Questions About Gauges

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Why do we need a gauge in our system ?

To see what the working pressure is in the system

To create a safe working environment

What do we need to mount a gauge in a system ?

To install a gauge you may need a Gauge Adaptor

MAMMUT Jacks

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MAMMUT Jack Pads

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MAMMUT Jacking Pads

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- Load mat can be used in 2 ways –
- (A) Entire Jack to be wheeled onto Jack pad / plinth (highly recommended)
- (B) Smaller jack pad / plinth positioned under cylinder.
- Larger surface area plinth will assist with stability & reduced submerging under load.

MAMMUT Jacks

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MAMMUT Important Safety Information

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CAUTION – THESE JACKS ARE A LIFTING DEVICE - NOT A LOAD HOLDING DEVICE

Use Jack Stands!

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Application Examples

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