INSPECTION UPON RECEIPT OF GOODS

On initial receipt of goods visually check for transit damage. If found contact the carrier immediately.

Hi-Force does not necessarily know the circumstances of use of a cylinder. Always refer to operating instructions for pumps, valves etc. used with the cylinder. If in doubt consult your Hi-Force distributor.

SAFETY

Read these instructions and safety warnings fully. Failure to do so could result in death, personal injury or equipment damage.

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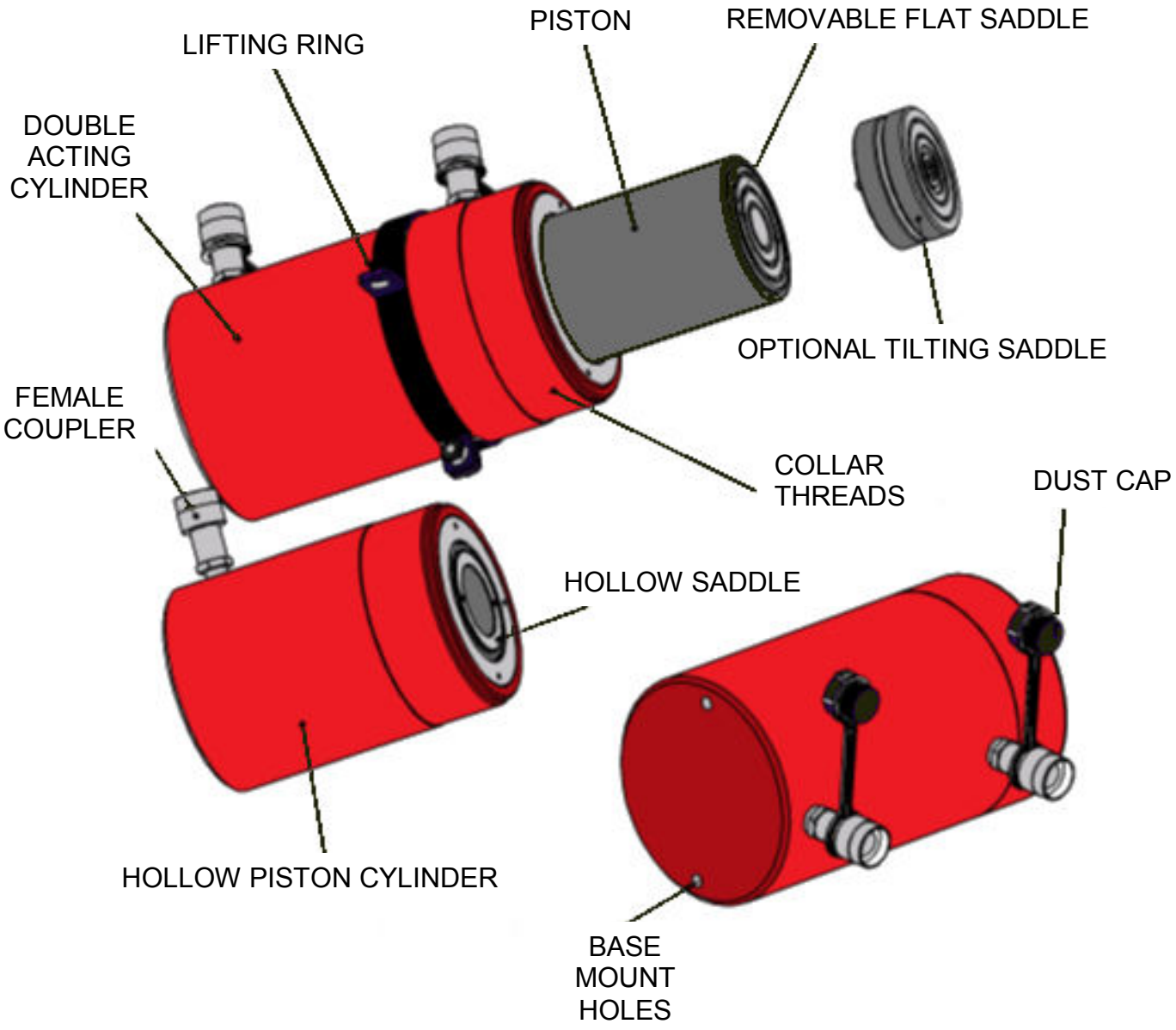
- Wear suitable personal protection equipment when operating hydraulic equipment. Keep all body parts away from cylinder and work piece / load.
- Do not work under a load supported only by hydraulic means. All loads once lifted should be supported with rigid mechanical props.
- Do not exceed rated capacity of cylinders. Hi-Force cylinders are designed for 700Bar maximum working pressure. Do not connect to a pump with a higher rated pressure.
- Never adjust the external pressure relief valve on the cylinder wall (where fitted).
- Ensure that all components in the system are rated for 700Bar.
- Use a pressure gauge in the system whenever possible.
- Do not handle pressurised hoses. Oil escaping under pressure from a ruptured hose can penetrate the skin. If oil is injected under the skin it is a serious medical emergency. See a doctor immediately.
- Avoid damaging hydraulic hoses. Always route hoses to ensure they are free from sharp bends and kinks.
- Avoid lifting loads that are not central to the piston. Offset loading damages cylinder bores and piston rods. Ensure the cylinder stands on a firm level surface.
- Always fully support the base of the cylinder. Do not use directly on soft ground, use suitable load spreading plates.
- Never pressurise a HVL cylinder without an external load, as this will damage the cylinder base and may cause injury.
- Do not weld anything to the cylinder.

- For further safety information and typical connection diagrams consult the Hi-Force catalogue or website www.hi-force.com

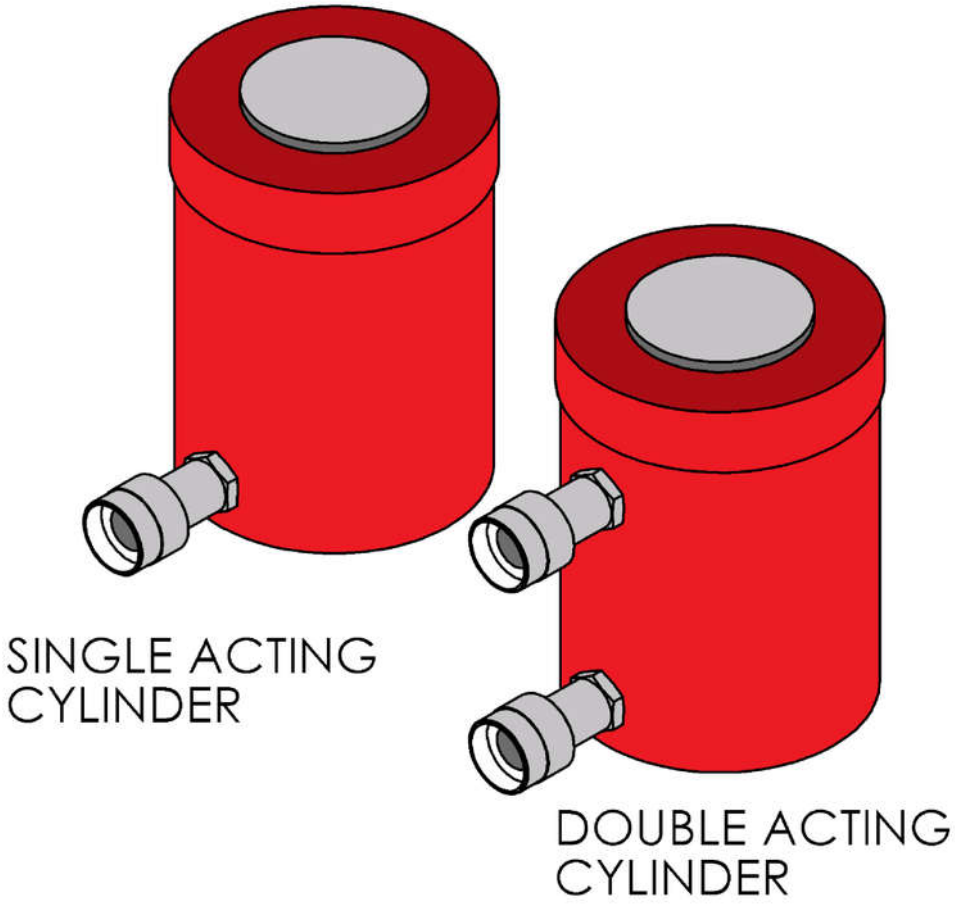
- See diagram below to aid identification of major components of cylinders.
  These instructions cover a wide variety of cylinders so actual proportions may differ from those shown.



CONNECTION AND BLEEDING

Ensure that the pump being used is suitable for the cylinder. A pump with a 2 way or three way valve and one hose should be used for single acting cylinders. A pump with a 4 way valve and two hoses MUST be used for double acting cylinders.

DANGER: **A double acting cylinder must always have both couplers connected.**



Connect hoses between the cylinder and pump ensuring that the couplers, where used are fully tightened – by hand only. A loose coupler will slow or stop the oil flow and is the most common cause of faulty operation.

Before putting the cylinder into service it is important to bleed air from the system.
New hoses and cylinders are not always completely full of oil. Remove this air as follows. Single acting cylinders: Locate cylinder below the pump with the piston pointing downwards (coupler uppermost). Operate the pump to fully extend and retract the cylinder several times. Double Acting cylinders: Locate the cylinder below the pump, on its side with the couplers uppermost. Operate the pump to fully advance and retract the cylinder several times.

CAUTION: In the case where very long hoses are used – especially with small cylinders- this procedure may not fully remove the air. Contact your Hi-Force distributor for advice on pre-filling of hoses with hydraulic oil.

OPERATION

A pump is used to advance and retract the cylinder. Refer to hydraulic pump operating instructions for details of operation of the pump.

- Hi-Force cylinders can be used in any orientation.
- Collar threads (where provided) are designed to withstand full cylinder capacity when fully screwed into suitable mountings. All collar threads are protected by a plastic thread protection cover to prevent damage to the threads when not in use.
- Base mounting holes (where provided) are not suitable for withstanding the full retract force of a double acting cylinder. They are for location purposes only.
- Some single acting cylinders are spring retract while some are load retract. The retract speed will be affected by hose length, cylinder orientation, valves in the system and external loads.
- Double acting cylinders are powered in both directions by the pump. Retract speed will be different to advance speed. This is generally faster, but in some cases may be slower than advance speed depending on the pump type and valves in the system.
- **WARNING:** When lowering loads on both single and double acting cylinders, the load may descend much faster than you expect. The use of a manual check valve (HFV66) is recommended for precise control of lowering speed.
- Ensure the cylinder is mounted on a solid smooth foundation. Do not use cylinders on sand or soil. Use load spreading plates as required.
- Tilting saddles are standard on some models and available as an optional accessory on some other models. These accommodate up to 5º of misalignment, and will reduce – but not remove – the risk of cylinder damage due to lateral loading.
- Ensure that the piston contacts the load as squarely as possible- even where tilting saddles are used.

CARE AND MAINTENANCE

Always use genuine Hi-Force hydraulic oil. The use of other fluids may invalidate your warranty.
After use, always fully retract pistons. When hoses are disconnected always fit dust caps to couplers.
Protect cylinders from the elements when not in use. If storing for prolonged periods, grease exposed metal parts. Never store cylinders in an extended piston condition.

> **CAUTION: A double acting cylinder will become pressurised in storage if it is subjected to a temperature rise. Approximately 10 bar for every 1ºC rise. This can cause difficulty when re-connecting couplers.**

To protect your warranty, have your cylinder serviced and repaired by an authorised Hi-Force repairer. Only use genuine Hi-Force spare parts. Spare parts sheets can be downloaded from our website www.hi-force.com

TROUBLESHOOTING

Refer to the following table to help identify the most common faults:-

PROBLEM	POSSIBLE CAUSE
Cylinder will not advance	Coupler not fully tightened Pump release valve open Pump oil level too low Pump malfunctioning Pump pressure relief valve set too low Load too great for cylinder Cylinder already at full stroke
Cylinder only advances part way	Pump oil capacity insufficient External obstruction
Cylinder does not advance smoothly	Air in system
Cylinder advances but will not hold load	Leaking seals Pump or valve malfunctioning Leaking connection
Cylinder leaking	Cylinder damage Seal damage Loose connection
Oil leaking from cylinder relief valve	Retract coupler not fully tightened Return line restricted
Cylinder slow to retract/does not retract	Broken retract spring (single acting spring retract only) Insufficient load (single acting load retract only) Retract coupler not fully tightened

NOTE(S):-

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