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2 Symbols

Safety Helmet

Ear Protection

Safety glasses

Safety boots

Safety gloves

General Warning or important note

Warning, this material contains corrosive substances

Dot not expose to open fire
3 Precaution

3.1 Instructions before operating

Before installing, handling, removing or starting to work with a hydraulic cylinder read this manual first. Make sure the appropriate personal protection equipment is used at all time. Only qualified personnel should be allowed to operate a hydraulic cylinder. ABS Cylinders B.V. is not responsible for damaged property, injuries or any other kind of damage occurred during the use of hydraulic cylinders by third parties.

3.2 Conditions

Make sure that the hydraulic cylinders are used in environmental conditions that are suitable for the hydraulic cylinders. ABS Cylinders B.V. will not guarantee that hydraulic cylinders will properly function in different conditions than they are made for. Also the lifetime of the hydraulic cylinder will be decreased when it is used in different environmental conditions.

3.3 Safety aspects hydraulic system

Hydraulic cylinders connected to a hydraulic system must comply with NEN-EN-ISO 4413 and NEN-EN 982.

3.4 Warnings

Never expose hydraulic cylinders or cylinder components to any kind of open fire!

Do not expose the hydraulic cylinder or it’s components to a temperature above 80°C unless you have approval of ABS Cylinders B.V. to use the hydraulic cylinder in environmental conditions with temperatures above 80°C.

Some hydraulic oil types contain corrosive substances!

Do not drill any holes in hydraulic cylinders!

Do not weld anything on hydraulic cylinders. If some extra mounting spot or anything else has to be welded on the hydraulic cylinder contact ABS Cylinders.
3.5 Preservation
In case that the hydraulic cylinder is not directly used, please protect the hydraulic cylinder with the following measures:

- Preferably the hydraulic cylinder should be filled 100% with oil.
- During transportation and lifting of the hydraulic cylinder the piston rod should always be fully retracted and must remain retracted during storage.
- Always protect the extended part of the piston rod. There are several ways to protect a piston rod from environmental threats. Greasing, oiling or waxing are some of the ways to protect the piston rod. Another way to protect the piston rod is wrapping with a Denso-system. (Never protect the piston rod with plastic foil but use air breathing material)
- Blind the connection ports of the hydraulic cylinder with steel plugs or blind flanges (SAE) to prevent the hydraulic cylinder from entering contamination and make sure that the hydraulic cylinder is air tight.
- Rod eyes and bottom eyes should be protected with cover-plates or equal. Trunnion should be covered by protection-bushings, protection-plates, Lamiflex® or equal.
- Oil, grease or wax (Rust-Ban 397 or equivalent, suitable for the environment) all blank surfaces (steel parts).
- Store the hydraulic cylinders in horizontal position, free from stresses and/or loads.
- The hydraulic cylinders should be stored in a closed building with a constant temperature between -10°C and +40°C. Sudden fluctuations in temperature can damage the hydraulic cylinder.
- The environment where the hydraulic cylinder is stored should be dry, out of direct sunlight, damp and erosive material. The relative humidity of the storage area should preferably not exceed 70%.
4 Installation manual

4.1 Personal protection

![Safety icons]

4.2 How to remove protection material

Before and during unpacking the hydraulic cylinder check if there are any damaged parts of the hydraulic cylinder occurred during transportation. First remove all package material, like plastic stretch seals, before installing the hydraulic cylinder. Some of the common used package materials for hydraulic cylinders are described in the following lines:

In case a bracket is used, to prevent the piston rod from extending during transportation, this must be removed carefully. When removing the bracket nobody may be standing in front of the piston rod, because the piston rod could extend. When the hydraulic cylinder needs to be mounted upside-down with the piston rod directing downwards, then the bracket that holds the piston rod in position must remain in place, until the hydraulic cylinder is mounted. Be aware, when removing the bracket that holds the piston rod in position the piston rod could extend because of its own weight. For double acting hydraulic cylinders, extending of the piston rod can be prevented by building up pressure on piston rod side.

4.3 Installation guide

- Be careful, there can be some over pressure in the hydraulic cylinder. Release pressure first.
- Make sure that all parts are cleaned and free of dust or any other threatening materials or media (such as water). Also clean the blank parts that are greased or equipped with preservation oil. The hoses and hydraulic pipes should be flushed before connecting these hoses or pipes to the hydraulic cylinder. Ensure every hose, pipe and/or valve is connected.
- Hydraulic cylinders which go "over-centre", when they extend, should first be filled with oil and air-released, as per chapter 6.5.
- Before mounting the hydraulic cylinder make sure all the bearings and pins are greased.
- Ensure that the centreline of the hydraulic cylinder is in line with the load. The load must be a 100% axial load on the hydraulic cylinder. Side loads or radial loads can be disastrous for hydraulic cylinders, unless the hydraulic cylinders are designed to take side loads and / or radial loads. Also the lifetime of the bearings, which are placed in the mounting eyes, will be shortened with radial loads, or loads caused by stress in the construction.
- Before using and testing the hydraulic cylinder, read chapter 5 'User guide'.
- Connect the hydraulic cylinder to its hydraulic system.
- Pressurize the hydraulic cylinder slowly until the piston rod is extending.
- Check the hydraulic cylinder for any internal or external leakage.
- If there is no indication of leakage, test the hydraulic cylinder at low pressure (at 25% of the design pressure). Test the hydraulic cylinder once in extending position and once in retracted position. Hold these positions for 5 min and check if the pressure remains at the pre-set pressure. When the pressure drops the hydraulic cylinder is leaking internal or external.
- Test the hydraulic cylinder at high pressure (design pressure). Test the hydraulic cylinder once in extending position and once in retracted position. Hold these positions for 5 min and check if the pressure remains at the pre-set pressure. When the pressure drops the hydraulic cylinder is leaking internal or external.
- When all tests are finished and no failure has occurred, the hydraulic cylinder is ready to be used again.
- Ensure that the used hydraulic system (pump-unit) that activates the hydraulic cylinder is in compliance with the standard ISO 4413 and / or EN 982.

⚠️ Stay out of the line of movement of the piston rod and do stay away from connection ports when the hydraulic cylinder is in operation.

4.4 Filling the hydraulic cylinder with oil

Ensure the correct hydraulic medium is used according to the specifications of the hydraulic cylinder. When using the wrong type of oil, seals of the hydraulic cylinder can be damaged, this can result in a leaking hydraulic cylinder.
4.5 Release air from the cylinder

Before releasing air from the hydraulic cylinder, make sure the hydraulic cylinder is not pressurized in any circumstances. The air bleed should be pointing upwards when the hydraulic cylinder is positioned horizontal. The piston rod must be in fully retracted position.

- Open the air bleed at the piston rod side or the hydraulic cylinder.
- Make sure every hose or pipe is connected as it should be connected.
- Set-up the hydraulic system and start it up. Set the relieve valve to a minimum pressure.
- Extend the piston rod slowly with no pressure built-up. Keep extending until there is oil / foam coming out of the air valve. (hydraulic cylinders that go over-centre must be air-released before mounting in the construction!)
- Shut down the system and close the air valve.
- Depressurise the system before opening the air valve at the lower side of the hydraulic cylinder.
- Start up the hydraulic system.
- Retract the hydraulic cylinder slowly with no pressure built-up. Keep retracting until there is oil / foam coming out of the air valve.
- Shut down the system and close the air valve.
- Retest the hydraulic cylinder by extending and retracting the piston rod until it's running smoothly.
5 User guide

5.1 Warnings

Standard hydraulic mineral oil should not exceed a temperature of 70°C during operation else it would damage the hydraulic system in use. Maximum temperature for water glycol is 50°C.

Do NOT exceed the maximum working pressure that the hydraulic cylinder is designed for. When the external load can induce a higher pressure, mount an additional pressure-relief valve (set at design pressure) directly to the hydraulic cylinder oil-port.

5.2 Who is allowed to operate a hydraulic cylinder

Everyone who is qualified to operate hydraulic systems can use this system. ABS Cilinders B.V. is not responsible and accountable for any accidents, injuries or damage to any equipment during the use of hydraulic cylinders or systems.

5.3 Personal protection

5.4 Who is allowed to operate a hydraulic cylinder

As operator, make sure nobody is near the equipment in operation. Before operating a hydraulic cylinder make sure everyone near the hydraulic cylinder or construction is wearing the right personal protection. Make sure the system is checked and functioning.
5.5 General information about accessories

**Linear Position System**

Linear Position System is an integrated positioning system which measures the length of the extending or retracting piston rod. This system is mounted in the hydraulic cylinder. The system is easy to use, because it is pre-installed and tested before the hydraulic cylinder leaves the factory.

**Mechanical end-switch**

Mechanical end-switches have no difficulties in usage, but be careful with this part because it's fragile.

**Proximity switch**

Like mechanical end-switches, proximity switches have no difficulties in usage. It's a sensor that checks for a ring or higher part on the piston rod. When such a ring or part of the piston rod has been reported, the sensor sends a signal to stop the hydraulic cylinder from extending or retracting. The sensor detects that the hydraulic cylinder is in the end position. Adjusting of proximity switches shall be done by qualified personnel.
6 Maintenance manual

6.1 Checklists

- Check the condition of all parts / components of the hydraulic cylinder every month. Look for damaged, corroded or worn parts.
- Keep the hydraulic system and components free from any kind of environmental threats.
- Check if the connections and fittings are still properly fixed. Connections that are loosened can cause leakage that will result in loss of oil, damages to the installation and environment.
- Check the oil temperature and oil cleanliness (NAS class) regularly. The oil temperature may not exceed 70°C else it will damage the seals of the hydraulic cylinder. Temperature of water glycol may not exceed 50°C.
- Cleaning with high-pressure spray-nozzle is not allowed. This to avoid damages on painting, silicon sealant, seals, dirt wiper, bearings, etc.
- Do NOT disassemble a hydraulic cylinder! If any part has to be replaced contact the manufacturer of the hydraulic cylinder. Warranty expires when disassembly is done by third parties.
6.2 Maintenance description for basic parts

Piston rod

- Fully actuate the piston rod minimum once a month (when the hydraulic cylinder is placed in a brackish or salt water environment, the frequency of retracting and extending should be minimum twice a week). This to extend the lifespan of the hydraulic cylinder.
- Check every month the surface of the piston rod for any kind of damage. The piston rod normally is protected with the oil containing in the hydraulic cylinder itself.
- Always protect the extended part of the piston rod (the part which is never in contact with oil)

Cylinder body

- Check every month for damages or cracks in the painting
- Repair any damages of painting immediately.
- Check every month for loose or damaged silicone sealant. In case of damage repair this immediately. Only use water-resistant silicone sealant.

Rod eyes/Bottom eyes/trunnion

When a hydraulic cylinder is provided with bearings, these bearings need to be greased or inspected once a month. Metal-to-metal contact is fatal; also the temperature will increase with metal-to-metal contact. The lifespan of bearings will decrease rapidly when it's not greased or oiled well. Maintenance-free bearings should not be greased! Maintenance free spherical ball bearings can be provided with protection-flanges with extra seals. The chamber, between the bearing and the seals can be filled with grease, as an extra barrier against water and dirt.

6.3 Oil maintenance

Changing oil and oil filters can be done by personnel who are certified in changing oil of hydraulic systems. Take an oil sample once a year and check the cleanliness and percentage of water in the oil (according EN 12937). The cleanliness of the oil must be according NAS class maximum 7 (according ISO 4406).

Do NOT open or disassemble any parts of the hydraulic system when it's pressurised!
CONTACT INFORMATION

Do you have a question, an assignment or would you just like some more information? We are happy to hear from you. You will find all the information you need to contact us below:

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