

## WHAT IS IN A HYDRAULIC LIFT?

Hydraulic systems are used for all sorts of things – from car braking systems to forklift trucks. Each of these systems use the same basic principle, and hydraulic lifts are no different.

The main components of a hydraulic elevator are:

- Piston within a cylinder (called a RAM)
- Oil reservoir or tank
- Pump
- Motor (to drive the pump)
- Valve

Usually, a hydraulic lift will have a machine room, which will house the pump, fluid and motor, so you may need more space than expected. You can get machine-room-less (MRL) hydraulic lifts which will generally house the machinery within the shaft, against the guides that run behind the lift, making them a more space-saving option.

## HOW DO HYDRAULIC LIFTS WORK?

Hydraulic lifts work on a basic principle. To go up, a pump pushes oil into the cylinder, pushing the piston (which pushes the lift car) up. To go down, the valve opens and oil is allowed to flow back into the tank and is pushed back using the gravitational force of the lift car.

When the valve is closed, the oil can only go from the reservoir into the cylinder. When the valve is open, the oil can only flow from the cylinder back into the reservoir.

The controls in the lift car make the pump operate, moving the oil. When a floor is reached, the pump is switched off and the lift car sits on top of the piston, held in position by the oil which is trapped in the cylinder.

The position, size and operation of the cylinder can be one of two options – ‘holed’ or ‘hole-less’.

## WHAT IS A HOLED HYDRAULIC LIFT?

A holed hydraulic lift is a traditional hydraulic lift. ‘Holed hydraulic’ refers to the hole required in the floor for the lift. The cylinder which encases the piston and pushes the lift car extends into the ground. The distance this extends is equal to the distance the lift car can travel upwards.

## WHAT IS A HOLE LESS HYDRAULIC LIFT?

A hole-less hydraulic lift means no need for a deep pit for the cylinder. The pistons are direct action and are mounted on the floor of the pit in line with the bottom corners of the lift car. The system operates like a jack and restricts travel to around 20-30m at most. This is not as common but allows for use where space is restricted going down, travel is short and a hydraulic system is required.

## PROS & CONS OF HYDRAULIC LIFTS

To help when choosing a lift, it is worth considering the benefits and limitations in relation to your requirements. Different environments, travel heights, usage levels and space available can be a deciding factor.

### PROS

With the machine room holding all the machinery, you won't need space above the shaft to hold machinery (which traction lifts do). The system is also supported by the floor/pit so should not need any kind of reinforcement.

The classic 'dead drop' situation is not possible in a hydraulic lift as there are no cables – though this doesn't often happen in reality. If the system breaks, then the lift will only drop at the speed at which oil can leak from the system.

Finally, hydraulic lifts are cheaper than traction lifts so if budget is key then this could help make the decision.

### CONS

It is worth looking at the travel distance when considering a new lift as a hydraulic lift system is quite slow (up to 1m/s). It may not be suitable for lifts over 6 floors. Also due to requiring further underground space to house the cylinder, a traction lift may be the way to go if you need a 6 floor lift or above.

Space required for a machine room and oil pit if required might not be suitable in all buildings, especially where floor space is at a premium. Digging down for holed systems can mean going very deep underground which may not always be possible.

Hydraulic systems rely on oil, which operates differently at different temperatures (oil gets thinner at higher temperatures) so a good system can help balance this effect.

As with any fluid, oil can leak out of the system which can cause issues. This doesn't tend to happen with new systems but keeping your lift maintained properly is vital.

Finally, if you are looking to meet BREEAM or energy efficiency ratings, hydraulic lifts are less energy efficient than other types of lift. The power required to raise the lift car is high, as the oil is doing all the work fighting against gravity. Alternatives, such as traction lifts, use a counterweight so require less energy.

If you need further assistance in choosing a lift right for you, please get in touch with a member of our team.

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