The Hercules - Electromagnet

Thank you for purchasing the Hercules Electromagnet.
We suggest that you take a few minutes to read through these notes to ensure you get long, safe and trouble-free service from your electromagnet.

Information and Safety

- Be aware that when activated Hercules has tremendous pulling power so be careful.
- When you switch the device on, make sure you do not get your fingers in-between the magnet and the bottom plate.
- When you bring the bottom plate near to the electromagnet magnet it will clunk lazily into place. Try pulling it apart and you will be unable to.
- Do not try to lift and hold in suspension really heavy loads as the magnet will fail once the battery runs out of power (in a 'continual-use test' we found it held a load of 50Kg for 20 minutes before failing). However, the lifting power and time that it can sustain a lift for, depends upon the type of battery being used and the power it contains.
- Lifting large loads with Hercules can be dangerous as the load will eventually fall without warning.
- The nylon cord which joins the electromagnet to the bottom plate is there to keep the components together. It is not capable of holding the maximum load.
- If you decide to hold a heavy load in suspension, set up your experiment so that it is only just off the ground and there is nothing to damage beneath it. In this way, if the load falls it will only drop a short distance and no harm will occur.
- Be sensible if you decide to see just how powerful the device is, as you will be dealing with large forces!

Fitting the battery

- You will need a PP3 battery.
- Ensure that the switch is set to the off position (on, is when the light bulb side of the switch is pressed down).
- Rotate the battery cover so that it opens to reveal the battery compartment.
- Inside (at the bottom of the compartment) you will see the battery snap for the PP3 battery.
- Carefully press the battery into place ensuring that the battery tag sits behind the battery for easy removal when it runs out of power.
- You are now ready to use Hercules!

Using the Electromagnet

- Before use, we suggest that you start with a new PP3 battery to ensure the maximum current is available to the device and to ensure it does not fail. (Hercules uses about 1.2amps of power).
- At the top and bottom of the device you will find lifting hooks (Karabiners) which have a spring loaded clip on them to keep the device secure in use.

- Hold the bottom plate away from the body of the device and carefully switch Hercules on. The tiny 'led' light bulb (light emitting diode) will illuminate showing that the power is being drained from the battery to the electromagnetic coil.
- Carefully bring the bottom plate towards the body of Hercules and it will come together gently, with seemingly little pulling power. Don't be fooled, the device is now gripping the bottom plate with tremendous power and will not release it until the current is switched off.

Some things to try:

1) Fit a short loop of sturdy nylon rope onto each Karabiner. Switch on and try pulling the device apart using the strength in your arms. With a strong battery you will be unable to pull the two sides apart.
   Switch Hercules off and you will find the magnetic pull becomes negligible and the device virtually falls apart.

2) Loop a sturdy chain or rope over a beam and set up a jig beneath the electromagnet which can be loaded with bricks or weighty objects. Make sure that the load is no more than a few centimetres above the ground and that nothing sits underneath the load table so that no damage can be done if it should fall.
   Be sensible and careful when using heavy loads.

What is an Electromagnet?

An electromagnet comprises of a soft iron core with a coil of copper wire wound around the outside of it. When a current is generated the iron core becomes a strong magnet but loses its magnetism once the power has been removed. A coil which is wrapped around the outside of a soft iron core is also called a solenoid.

Uses of Electromagnets:

Electromagnets can be incredibly powerful and can be switched on or off as required ... this makes them very useful. There are more electromagnets around than you might think! The electric motor for example is essentially an electromagnet that is made to rotate within stationary magnets. Big electromagnets can be seen lifting cars in scrap yards. All telephones, mobile phones and speakers contain small electromagnets in them. Relays and electrical solenoid switches all contain electromagnets and they are extensively used to separate materials at recycling plants. They are used as particle accelerators and in hospitals in a host of different devices... where would we be without them?

We hope you like the Hercules Electromagnet. Find out more about magnets and the magnets we sell at www.shawmagnets.com

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