

Introduction

This training course deals with lead acid battery Health and Safety

It will provide you with information on understanding the Health & Safety information for working with lead acid batteries.

The course consists of the following modules:

- Health & safety overview
- Battery labelling information
- Hazards, precautions & actions
- Battery transportation & disposal

Each module has its own training video, downloadable resources and some will be followed by a short multiple-choice test.

Once you have completed all modules there will be a final test to check your understanding and knowledge.

Once passed you will earn a certificate for the completion of this course.

Module 1 - Health & Safety Overview

Providing sensible precautions are observed handling and proper use of lead acid batteries is not hazardous if personnel have been adequately trained.

The purpose of this guide is to indicate the main hazards which may arise and the precautions you should take to minimise these.

I will also outline the actions to be taken in the event of an emergency or accident

Module 2 - Battery Labelling Information

Battery labels feature a range of health and safety and environmental disposal icons.

We will cover these individually.

This icon indicates you must follow the guidance laid out in the manufacturers operating instructions before attempting to handle, operate or install the battery.

The eye protection icon indicates that suitable eye protection must be worn when handling a battery to prevent foreign objects, liquids or vapours entering the eye.

This prohibitive icon instructs that children must be kept away from and never allowed access to a battery.

The instruction to never smoke, allow naked flames or sparks near a battery is indicated by this icon.

The explosive material warning icon indicates danger as the battery emits a mixture of oxygen and hydrogen gas which is an explosive risk.

This icon indicates the danger posed by the acid contained in a battery.

As this is corrosive, leaks in the form of droplets, spray or mist will cause burns and irritation to the skin, eyes and could seriously damage clothing.

The Pb symbol indicates that the battery contains lead and lead compounds which are harmful to health if ingested.

Waste lead acid batteries are harmful to the environment.

This symbol indicates they should be collected separately, taken to a designated waste reclamation site and must not be disposed of as domestic waste.

This symbol indicates waste lead acid batteries are recyclable and should be recycled following local reclamation procedures.

Module 3 - Hazards, Precautions & Actions

Battery electrolyte contains sulphuric acid which may leak.

It may also be released as droplets, spray or mist during the recharge process.

Acid is a corrosive and poisonous liquid which will cause burns or irritation to the skin and eyes and can severely damage clothing.

When working with batteries, you should always:

- Handle with care
- Store upright
- Charge in a well-ventilated area
- Wear eye protection and protective clothing
- & follow all hazard and warning label icons

You should never:

- Overfill with electrolyte
- Give children access
- Allow battery vents to become blocked.
- Or attempt to open a battery case

If any acid comes into contact with your skin immediately soak the affected area with lots of clean water, remove any contaminated clothing and seek medical attention if irritation persists.

For contact with the eyes immediately irrigate the eyes for at least ten minutes with clean water and seek medical attention.

If acid is ingested immediately drink as much water as possible.

Do not induce vomiting and seek urgent medical attention.

For small electrolyte spillages wash the area with large quantities of water.

For larger spillages use an acid spill kit to contain the affected area and absorb the spill.

Dispose of the absorbent material in clearly labelled acid resistant containers in accordance with the environmental guidelines.

There are various hazards associated with electrical energy when working with and maintaining lead acid batteries.

Conductive objects such as metal tools or jewellery can create accidental short circuits of battery terminals.

This may generate sufficient heat to cause severe burns, create arcing or cause any metal to melt and splash.

Severe electrical shocks may also be received from faulty charging equipment.

High voltage battery systems pose a further risk, as the batteries are connected in series.

For example, forty 12-volt batteries connected in series deliver a total of 480 volts.

Always remove metal objects such as rings bracelets, watches and necklaces before working with batteries.

Always take great care to avoid shorting the live terminal to earth and never place tools or metal objects near to or on top of a battery.

If affected by an electrical burn apply a sterile dressing and seek medical treatment.

For electric shocks approach the affected person with care.

If the individual is clear of the conductor then, with caution, switch off equipment.

If the individual is still attached to the conductor do not touch with bare hands.

If possible use a suitable insulated material such as wood, rubber, plastic or rolled paper, to detach the conductor from the victim.

If necessary, summon medical assistance then give artificial respiration until it arrives.

When working on vehicle electrical systems always disconnect the battery.

But before disconnection switch off all electrical loads and refer to vehicle manufacturer's handbook.

Make the earthing point as far away from the battery as possible the first disconnection and the last reconnection when work is complete.

Gas emissions produced by batteries can cause a further hazard.

Hydrogen & oxygen gases are both produced during recharging.

These gases may also be emitted at other times, for example, if the battery is moved or shaken.

The hydrogen gas is explosive at concentration levels above 4% in an enclosed space.

Therefore, always store, charge and install batteries in a well-ventilated area.

To reduce the risk of sparks causing an explosion the charging leads must be correctly fitted before turning on the mains power

Switch off the mains power and wait for a minimum of 5 minutes before disconnecting the charging leads.

Always handle cables and connections in a way that avoids accidental sparking.

Never smoke, allow naked flames or create sparks near a battery.

Be aware that static can create a spark of electricity that can penetrate the battery case and cause an explosion.

Causes of static include removing labels and contact with man-made fibres.

If an explosion occurs acid will have been released and battery fragments may have caused severe lacerations.

In this case seek medical advice appropriate to the injuries.

Batteries are awkward and heavy to handle.

Failing to handle them correctly can result in personal injury from acid spillage, muscle strains and broken bones.

Always use the correct lifting procedures to minimise strain on the body.

Always use the lifting handle or lifting ledges on the battery, ensuring they are correctly attached and positioned prior to lifting.

If an injury occurs when lifting seek medical advice as appropriate and remember that acid may have been spilled if an accident has occurred.

No attempt should ever be made to renovate or repair a damaged battery.

This work involves all hazards detailed previously and should only be carried out by suitably trained personnel with appropriate facilities.

Since batteries contain combustible materials, the local Fire Authority should be consulted when a quantity of batteries are stored together.

Incorrectly jump starting a vehicle can result in a battery explosion, fire, burns or damage to the vehicle electrical system.

It is therefore essential that the correct procedure as defined by the vehicle manufacturer's handbook is always followed.

Make sure the vehicles are not touching, the ignition in both vehicles is turned off and both vehicles are in neutral or park.

The most common procedure is to firstly connect the red positive cable to the positive terminal on the non-start vehicle battery.

Then connect the opposite end of this cable to the positive terminal on the jump vehicle's battery.

Now connect the black negative cable to the negative terminal on the jump vehicle's battery.

Finally connect the other end to a suitable earth point on the non-start vehicle, away from the battery and clear of fuel lines and brake pipes.

A suitable point is the engine block.

Ensure all connections are tight and away from moving or rotating components.

Start the jump vehicles engine and allow it to run for one minute.

Start the engine of the non-start vehicle and allow it to run for at least one minute before switching off the jump vehicles engine.

Remove the cables in the opposite order keeping them well away from any moving or rotating components on the vehicle.

If any injury occurs during this procedure seek medical advice as appropriate to the injury.

Module 4 - Battery Transportation & Disposal

The transportation of lead acid batteries is regulated by ADR, which gives guidance on the safe carriage of dangerous goods.

Batteries can be considered dangerous goods because they pose a risk of:

- Fire or explosion
- Acid spills
- Unsecured load impacts

It is the responsibility of the company transporting the battery to ensure full ADR compliance.

The correct hazard signage must also be displayed on the vehicle if appropriate.

To assist with this GS Yuasa, provide Material Safety Data Sheets for all products. These can be downloaded below or from www.yuasa.com.

All spent batteries packaging material and any waste arising from spillages and fires must be disposed of in accordance with all relevant European and National legislation.

REACH is the Registration, Evaluation, Authorisation & Restriction of Chemicals.

Industry is required by REACH to evaluate and manage the risks posed by chemicals, and to provide safety information to product users.

Information on up-to-date additions to the Substances of Very High Concern Candidate list is available from the European Chemicals Agency web site.

You will find a link to this below.

Any waste electrical device or equipment sold by GS Yuasa is subject to the relevant European and National legislation.