SECTION 1

Health and safety in the automotive environment

USE THIS SPACE FOR LEARNER NOTES

Learning objectives

After studying this section you should be able to:

- **List the main legislation relating to automotive environment health and safety and describe the general legal duties of employers and employees.**
- **Identify key hazards and risks and describe policies and procedures for reporting them.**
- **Identify key warning signs and their characteristics.**
- **Explain the importance of wearing Personal Protective Equipment (PPE).**
- **State the meaning of common product warning labels.**
- **Identify fire extinguishers in common use and which types of fire they should be used on.**
- **State procedures that need to be taken with tools, equipment and materials.**
- **Describe vehicle and personal safety considerations when working at the roadside.**

Key terms

Match the definition using the terms at the bottom of the page.

Cancer forming. **Carcinogenic**

Likelihood or chance of harm being caused. **Risk**

Poisonous, likely to cause injury or death (often chemical). **Toxic**

Something likely to cause harm or loss – a source of danger. **Hazard**

Substance likely to catch fire. **Flammable/inflammable**

An unplanned event that results in injury, ill-health or damage. **Accident**

Substance that can destroy tissue, usually strong acid or alkali. **Corrosive**

Substance that can cause ill-health or injury. **Harmful**

Evaporates readily – can cause fire or explosion, e.g. petrol. **Volatile**

Hazard, Risk, Accident, Carcinogenic, Flammable/inflammable, Volatile, Toxic, Harmful, Corrosive

Health and safety starter

Try your hand at this word search to become familiar with some of the terms in this chapter.

T N B A T W E W C W X B H N R
N L O K X H Q O K M B R D X E
A D W I R P R I O V E O M I G
T D Z N T R P K F H Y D I Z U
I P B N O C H C S H T J W Y L
R B R S W L U I H A Z A R D A
R G I O E Q U D Y L Q C D Z T
I V I N H G H J N V F T Z H I
E C O R N I S K R I J S Y M O
V Z F I R E B L A N K E T Z N
B R T L L E M I P W F Q O C L
P X I G C Y R O T A D N A M H
E R G S V T K H I I M F I B V
M O U D K P L I O N O K F R I
G X I T X R R X Z G A N Z R P

ACTS
CORROSIVE
EXTINGUISHER
FIREBLANKET
GOGGLES
HAZARD
INDUCTION
IRRITANT
MANDATORY
PROHIBITION
REGULATION
RISK

HEALTH AND SAFETY AT WORK ACT 1974 (HASAWA)

The Health and Safety at Work Act (HASAWA) covers all people at work whatever their occupation and sets out employer's and employees' duties regarding health and safety in the workplace. The workplace could include anywhere that people are employed such as garages, colleges or training providers, therefore it affects you!

The Act is enforced by the Health and Safety Executive (HSE), which has inspectors who give advice to employers, check workplaces, and investigate accidents.

Employers must display a Health and Safety Law poster or provide employees with a booklet, which is available from the HSE website.

HSE

New poster

Find your Health and Safety Law poster or visit the HSE website to view a Health and Safety Law pocket card and list at least four employer duties.

1 carry out risk assessments on anything that could cause harm and determine precautions to prevent harm

2 tell you in a way you can understand how risks will be controlled and who is responsible for this

3 provide health and safety training

4 provide necessary equipment or protective clothing free of charge and ensure it is properly looked after.

Health and safety regulations are updated frequently.

Check **www.hse.gov.uk** for the latest regulations.

Enforcement

A body called The Health and Safety Executive Inspectorate enforces the HASAWA. Its inspectors have various powers and penalties at their disposal.

Describe the two main types of enforcement that the HSE inspectorate may take.

1 **improvement notice** – this gives the employer at least 21 days to put safety matters right

2 **prohibition notice** – this is where an activity involves serious risk or injury and must stop until remedial action has been taken.

Look back at the Health and Safety poster for your responsibilities.

SPECIFIC ACTS AND REGULATIONS

Below is a list of various Regulations which mostly apply to special situations. The Regulations add further depth and detail to the Acts. They are made as the need arises and carry as much legal authority as the Act to which they relate. New or amended Regulations therefore keep the Acts up-to-date.

Electricity at Work Regulations 1989
Workplace (Health, Safety and Welfare) Regulations 1992
Personal Protective Equipment at Work Regulations 1992
Provision and Use of Work Equipment Regulations 1998 (PUWER)
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
Management of Health and Safety at Work Regulations 1999
Control of Substances Hazardous to Health Regulations 2002 (COSHH)
Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
Manual Handling Regulations 1992 (amended 2002)
Control of Noise at Work Regulations 2005
Health and Safety (Display Screen Equipment) Regulations 1992
Health and Safety (First Aid) Regulations 1981
Employers' Liability (Compulsory Insurance) Act 1969
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)
Pressure Systems Safety Regulations 2000

State which Regulation would be relevant to each of the following situations.

1 Removing a road wheel from a heavy-duty four-wheel drive off-road car.
Manual Handling Regulations 1992

2 Cleaning the dust from rear drum brakes.
Control of Substances Hazardous to Health Regulations 2002 (COSHH)

3 Draining petrol from a fuel tank.
Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002

4 Using a bench grinder to sharpen a cold chisel.

Provision and Use of Work Equipment Regulations 1998 (PUWER)

5 Lifting an engine/gearbox assembly from a vehicle using chains and an engine hoist.

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

6 Using a mains electricity power washer to clean a vehicle exterior.

Electricity at Work Regulations 1989

7 Carrying out a major routine service on a car.

Personal Protective Equipment at Work Regulations 1992

8 Working on a rolling road with performance vehicles.

Control of Noise at Work Regulations 2005

9 Working using a computer for 5 hours a day.

Health and Safety (Display Screen Equipment) Regulations 1992

10 Removing a steering wheel with an air bag fitted.

Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002

The HSE website now has a dedicated motor vehicle repair section dealing with our industry.

RISK ASSESSMENT

In 1992 The Management of Health and Safety at Work Regulations were created which gave more detail to the general requirements of the HASAWA.

In general, employers have to carry out risk assessments where specific hazards have been identified.

This is the suggested method from the HSE:

- **Identify the hazards.**
- **Decide who might be harmed and how.**
- **Evaluate the risks and decide on precautions – change process, modify or PPE.**
- **Record findings and implement (communicate to employees – training may be required).**
- **Review assessments and update if necessary.**

Who would be likely to carry out a risk assessment in the workplace?

garage owner, service or workshop manager or nominated company safety representative

Here are some examples of garage hazards that require a risk assessment:

- **draining vehicle fuel tanks.**
- **handling vehicle air bags.**
- **using mains electrical equipment.**

Suggest three hazards in your workshop that would require a risk assessment.

1 hazardous substances – e.g. draining engine oil, degreasant tank, anti-freeze, exhaust fumes

2 raising vehicles (hoists and jacks)

3 compressed air.

The motor vehicle repair section of the HSE website gives good examples of hazards.

INITIAL INDUCTION TO HEALTH AND SAFETY REQUIREMENTS

When new members of staff start at the garage they will need to receive an in-company health and safety induction. This is important to ensure new staff members are aware of safe procedures and processes.

You are the supervisor in a large dealership running the light vehicle maintenance and repair workshop. You have a new trainee starting next week.

In your group discuss what should be covered in a good company initial induction for a 16-year-old trainee.

- a tour of the premises and introduction to key staff
- the trainee's legal responsibilities to themselves and others – make them aware of the Health and Safety Law poster
- the company's health and safety policy, organization and arrangements
- supervision arrangements – who do they report to for help
- significant risks and the control measures (processes, machinery or products) that are prohibited at this stage or need supervision.

REPORTING TO THE HEALTH AND SAFETY EXECUTIVE

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)

Certain situations at work require employers to report by various methods to the HSE, to identify where and how risks arise, and to investigate serious accidents.

Find information on the Reporting of Injuries, Diseases and Dangerous Occurences Regulations (RIDDOR) and state what should be reported.

- deaths
- major injuries, e.g. fractured bone and dislocation of joints
- over-three-day injuries – where an employee or self-employed person is away from work or unable to perform their normal work duties for more than 3 consecutive days
- injuries to members of the public or people not at work where they are taken from the scene of an accident to hospital
- some work-related diseases
- dangerous occurrences – where something happens that does not result in an injury, but could have done.

How is it reported?

- telephone Incident Contact Centre 0845 300 99 23
- online (HSE website)
- email
- post.

Dangerous occurrence

Even if no one was injured, incidents such as hydraulic failure of lifting equipment including jacks or engine hoists are reportable.

ACCIDENT RECORDING

If you have an accident at work, which types of injuries have to be reported to your employer?

all injuries should be reported

Injuries are recorded and records held for 3 years.

Most companies use an accident book, which must contain the following:

- **Injured person's personal details – Name, age (DOB), job description.**

- **Details of the injury – Nature of the injury and how it occurred.**
- **When the accident happened – Date, time and location.**

Who can fill out the accident book?

anyone – although it is often the first aider

REPORTING SAFETY CONCERNS

You have a legal responsibility to protect yourself and others; therefore, if you find a potential hazard then it is your duty to report it to your supervisor.

Why should you report a hydraulic jack that is leaking?

because the seal could fail and cause the jack to come down unexpectedly

In your organization there may be a procedure of labelling faulty equipment to prevent use until action is taken.

Pictures supplied by Draper Tools Limited

CAUSES OF ACCIDENTS

Generally speaking, accidents are caused by:

Human	*Environmental*
1 Ignorance of the dangers involved.	1 Unguarded or faulty machinery.
2 Failure to take adequate precautions.	2 Incorrect or faulty tools.
3 Tiredness, causing lack of concentration.	3 Inadequate ventilation.
4 Fooling about.	4 Badly-lit workshops.

State six other causes of accidents in the workplace:

1 effects of drink or drugs

2 lack of routine maintenance on workshop equipment

3 lack of training, resulting in lack of skills and knowledge

4 lack of adequate supervision

5 untidy or dirty workplace

6 poor safety culture (lack of employer commitment, e.g. no safety policy).

SAFETY SIGNS

There are four types of safety signs, identify each of the following:

prohibition sign | warning sign | mandatory sign | safe condition sign

Contrasting colours make the sign more conspicuous.

Black is used with Yellow. White is used with Red, Blue or Green.

Prohibition signs

State the meaning of prohibition.

do not do, stop, not permitted, forbidden

State what prohibition is indicated in the following signs:

HSE

no naked flames | no pedestrians | do not extinguish with water | not drinking water | no smoking

Warning signs

State the risk that each sign indicates:

risk of danger

fire

electric shock

corrosive substance

mind your head

toxic hazard

explosion

fork-lifts operating

HSE

Mandatory signs

State the meaning of mandatory – you must do!

State the type of protection that must be worn:

wear eye protection

safety helmets must be worn

wear ear protectors

safety boots must be worn

safety gloves must be worn

safety overalls must be worn

face protection must be worn

respirators must be worn

HSE

Safe condition

State what each sign indicates:

first aid box

safety shower

eyewash station

emergency exit

proceed forward to fire exit

HSE

PERSONAL PROTECTIVE EQUIPMENT (PPE)

All Personal Protective Equipment (PPE) in use at work should carry the CE mark and where appropriate should comply with a European Norm (EN) standard.

Which parts of the body do the following items of PPE protect?

Overalls – body from loose clothing and a barrier from harmful substances

Steel toecapped boots or shoes – toes from crushing, sole from oil and grease

Safety goggles – eyes from swarf and dust

Welding mask – eyes and face from infrared rays and bright light

Hard hat – head from falling objects

Gloves – hands from chemicals, burns and cuts from sharp objects

Ear defenders and plugs – ears from sudden or prolonged loud noise

Dust mask or respirator – lungs from damage

Eye protection

Give examples of where the following eye protection may be worn in a garage environment.

Face mask using degreasant parts washer
high speed grinding

Darkened face mask electric arc welding
MIG welding

Clear goggles or safety glasses drilling
grinding
using mechanical or hydraulic press
removing hub bearings
working under vehicles (rusty exhaust)
chiselling
working with chemicals

Darkened goggles oxy-acetylene welding
general heating using naked flames

Pictures supplied by Draper Tools Limited

Hearing protection

Pictures supplied by Draper Tools Limited

Ear defenders (ear muffs)

Disposable ear plugs

Give **two** examples of where hearing protection may be needed in a garage environment.

1 use of compressed air tools such as air chisel or impact guns (air ratchet)

2 prolonged use of an angle grinder

Head protection

Three types of head protection may be used in a garage workshop.

Describe what the following head wear protects.

1 Bump cap 

protects the head from grease, dirt and minor cuts

2 Hair net cap 

prevents long-haired workers from getting their hair caught up in revolving machinery

3 Hard hat 

best protection when working under vehicles against bruising and cuts

Skin protection

Thoroughly cleaning the skin, particularly hands, face and neck, is extremely important. How should hands be protected?

- use of barrier cream before starting work
- use hand cleanser after completing work
- do not use solvents such as petrol, thinners or brake cleaners to clean hands as they remove natural skin oils.

Hand protection

Give examples of where these gloves could be used to protect your hands.

Pictures supplied by Draper Tools Limited

Heavy-duty leather gloves

when welding

removing hot exhaust components

removing hot engine cooling components

Latex gloves

general work with oil or grease

changing engine oil

working with brake fluid

TIP Latex gloves can cause an allergic reaction on those sensitive to latex. Vinyl or nitrile may be an alternative.

Pictures supplied by Draper Tools Limited

Nitrile gloves

using parts washer (degreasant)

using solvents such as brake cleaner

Rigger gloves

handling sharp body panels

removing gearboxes with sharp machined facing

removing rusty parts

removal of broken glass

TIP If during servicing or repair activities hypodermic needles are found, inform your supervisor to organise for specialist removal.

Special gloves, which cannot be penetrated, are required for this procedure.

Protection of lungs

Dust masks may be worn to protect your lungs from dust.

Pictures supplied by Draper Tools Limited

Give examples where dust masks would be used.

rubbing down filler on bodywork

cleaning brakes and clutches

sanding and grinding

Care of Personal Protective Equipment

Report any faults with PPE to your supervisor immediately.

State what you would check for on each of following items of PPE:

Safety goggles – lens is clean and not cracked or elastic strap is not stretched

Overalls – clean, no rips or tears and a correct fit with fasteners in good condition

Safety boots – steel toe-cap in place, sole not cracked or worn and laces in place

Gloves – no tears or rips and leather gloves not contaminated with fluid

Ear defenders – foam seals not split and adjuster working to hold pads firmly on ears

Dust masks – contamination (dirty filter) or valve working (if fitted) and straps secure

HAZARDOUS SUBSTANCES

Under COSHH, or the Control of Substances Hazardous to Health Regulations 2002, all persons at work need to know the safety precautions to take so as not to endanger themselves or others through exposure to substances hazardous to health.

Using the table below state the hazard each symbol represents and explain the likely effects caused by a substance that is labelled with each symbol.

Symbol	*Hazard*	*Effect*
	toxic	may cause serious health risk or even death if inhaled, ingested or if it penetrates the skin
	harmful	may cause limited health risk if inhaled or ingested or if it penetrates the skin
	irritant	may cause inflammation or irritation on immediate or prolonged contact with the skin or if inhaled
	corrosive	may on contact cause destruction of living tissue or severe burns
	highly flammable	would catch fire easily, low flash point
	explosive	risk of explosion by shock, friction, fire or other sources of ignition
	dangerous for the environment	very toxic to aquatic organisms, may cause long-term effects in aquatic environment

HSE

http://www.hse.gov.uk
http://www.onsafelines.com/

A new system of marking hazardous substances is to be fully in place by 1 June 2015. The table below gives the new symbols under **C**lassification **L**abelling and **P**ackaging Regulations, abbreviated to **CLP.**

You will see more use of these symbols before this date.

	Example of hazard statement	**Example of precautionary statement**
	Heating may cause an explosion	Keep away from heat/ sparks/open flames/ hot surfaces – no smoking
	Heating may cause a fire	Keep only in original container
	May intensify fire; oxidizer	Take any precaution to avoid mixing with combustibles
	Causes serious eye damage	Wear eye protection
	Toxic if swallowed	Do not eat, drink or smoke when using this product
	Toxic to the aquatic life, with long-lasting effects	Avoid release to the environment
	**New pictogram**, reflects serious longer-term health hazards such as carcinogenicity and respiratory sensitization e.g. may cause allergy or asthma symptoms or breathing difficulties if inhaled	In case of inadequate ventilation, wear respiratory protection
	**New pictogram**, refers to less serious health hazards such as skin irritancy/sensitisation and replaces the CHIP  symbol e.g. may cause an allergic skin reaction	Contaminated work clothing should not be allowed out of the workplace
	**New pictogram**, used when the containers hold gas under pressure e.g. may explode when heated	None

HSE

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) data sheets

All hazardous substances supplied must have either a paper-based or web-based **M**aterial **S**afety **D**ata **S**heet (MSDS) available.

Harmful substances

Certain activities in a motor vehicle repair premises present particular health hazards. The hazards may, for example, be due to breathing in polluted air or coming into contact with harmful substances. (See COSHH Regulations.)

List three toxic gases or substances likely to be present in a motor vehicle repair workshop:

- carbon monoxide (exhaust fumes)
- antifreeze
- sulphuric acid.

http://www.commaoil.com/

http://www.autoglym.co.uk

Or use a search engine to find companies' MSDS

Group activity

Discuss the hazardous actions in the table opposite. Identify the potential hazards and agree on precautions which can be taken to reduce the risk of each hazard occurring.

Hazardous actions	*Potential hazard*	*Suitable precautions*
Engine tuning	exhaust fumes: carbon monoxide	pipe gases outside, adequate ventilation, use of extractor fans, gas not aimed into confined space
Welding	harmful fumes when welding galvanized metals	use of extractor fans and taking care not to inhale fumes
Degreasing parts washer	fluid can dry out the skin Contaminated fluid can be carcinogenic	gloves and goggles to be worn do not eat or drink near the tank
Battery charging	sulphuric acid and hydrogen gas	wear goggles and gloves and ventilate area well

ELECTRICAL SAFETY

Two dangers arising as a result of using electricity in a workshop are:

- ***fire* possibly caused by an electric circuit overheating or a burst bulb igniting fuel**
- ***electric shock* as a result of someone coming into contact with a live circuit.**

For safety reasons hand-held electrically operated equipment and hand lamps should use reduced voltage.

To further reduce the risk of fire and electrocution many garages use battery-operated hand-held equipment.

What could cause a circuit to overheat?

overloading an electrical socket

using a number of plugs with adaptors

using an incorrect sized cable for circuit

Pictures supplied by Draper Tools Limited

Checks on mains electrical equipment

Checks that should be made on the body of the power tool are given below. Complete the table stating the checks that should be completed on the cable and the plug.

Checks on the body of the power tool  Pictures supplied by Draper Tools Limited	• make sure the tool is free from dirt or grease and vents are clear • check for cracks • check the tool has a label to show that it passed a portable appliance test (PAT) and is in date • check for correct operation of the switch.
Checks on the cable  Pictures supplied by Draper Tools Limited	• cuts in the insulation • worn insulation (chaffed) • burnt insulation • exposed wires • check for unprofessional repairs (taped).
Checks on the plug 	• is clean and dry • the pins are in place and not loose or bent • plug casing is not cracked • the flex is clamped in the plug.

FLAMMABLE LIQUIDS AND GASES

Many flammable substances are used in garages. List five other examples below.

1 petrol

2 brake cleaner

3 paint

4 degreasant

5 thinners

6 acetylene.

Some liquids are *volatile.* What is meant by this and what particular hazards can this present during the normal course of repair work?

volatile liquids readily vaporize at room temperature (20°C)

as volatile liquids are normally lighter than air, vapours can be moved by air currents to a source of ignition

Draining a fuel tank

You are about to drain the petrol from a vehicle's tank.

Describe how to safely complete the procedure in the form of a bullet point list. Use the image to help you.

- Ensure there are no naked flames or sparks in the local area and make sure there is good ventilation.
- Advisable to disconnect vehicle battery.

Sealey Group

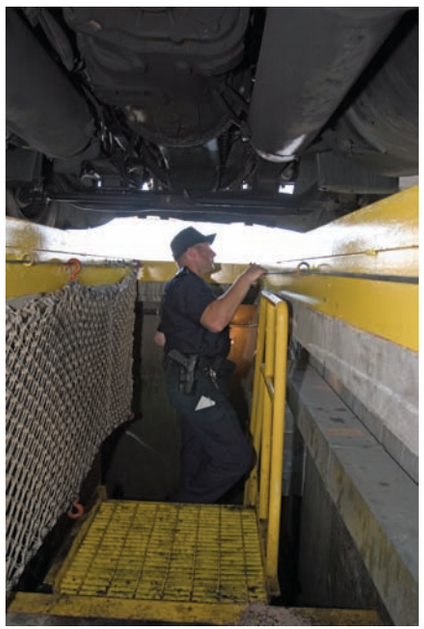
- Use an appropriate fuel tank drainer close to the fuel filler cap.
- Connect earth strap to the vehicle ensuring good electrical connection.
- Connect second earth strap to a good earth (ramp bolts are good).
- Using the pump, remove all fuel from the tank.
- Close off valves to prevent escape of fumes.
- Remove to a safe position (away from sources of combustion or physical damage).

WWW Visit **http://www.hartleige.com/product/fuel-tank-drainers** to find out more about fuel retrievers.

Look at the scenarios below and answer these questions relating to garage situations where flammable substances or gases are involved.

1 Why should petrol not be drained near this vehicle inspection pit?

petrol fumes are heavier than air and may gather in the bottom of the pit, causing a potential fire hazard if a spark occurs



2 What could happen if you disconnected the battery charger from the battery terminals while the charger is still operating?

could cause the hydrogen given off to explode, blowing the top off the battery and acid could get into your eyes and on your skin

3 What could happen if the fuel pressure was not relieved?

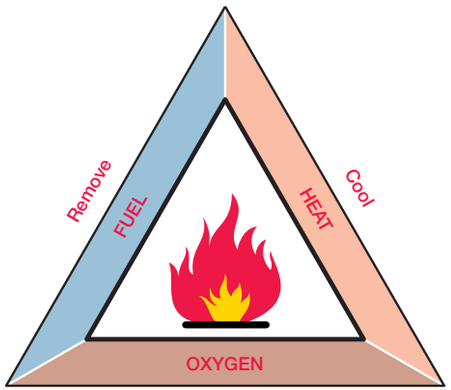
excess fuel coming out could be ignited by a spark

FIREFIGHTING EQUIPMENT

Liquids or chemicals that are highly combustible are commonly found in motor vehicle workshops such as petrol, cleaning solvents, paints, etc. It is therefore important that everyone tries to prevent a fire and has a working knowledge of how to use the correct type of fire extinguisher required to eliminate a fire.

Complete the triangle to show:

- **The three elements needed to start a fire.**
- **One action needed to stop each element and stop the fire.**



Cut out (smother)

Fires are classified by their type and a letter is used to identify which fire extinguisher will put out each type of fire.

Fire extinguishers

There are four main types of fire extinguishers available in garages which are suitable for stopping different types of fire.

Look at the **TYPES OF FIRE** under the Classification of Fire Risk, and **TICK** in the grid which type of FIRE extinguisher would be suitable.

Classification of Fire Risk				
Class A Paper, wood, textiles	✓	✓		✓
Class B Flammable liquids		✓	✓	✓
Class C Flammable gases, liquids			✓	✓
Electrical hazards			✓	✓

Which extinguishers must not be used on mains electrical fires and why?

water and foam – both contain water and could conduct high voltage electricity

Colour coding for fire extinguishers

Since January 1997 the British standard for fire extinguishers has been **BS EN 3.** This standard states that all fire extinguishers must be red, although 5 per cent may be colour coded using the former colours.

Fire extinguishers sold before January 1997 which are painted in the old colours are still allowed providing they are in good condition and recharged correctly.

State which of the three elements the extinguisher removes and briefly describe how to use each extinguisher.

Foam

Also known as AFFF (Aqueous Film-Forming Foam).

Removes – oxygen

How to use – using the spray action, lay the foam over the burning liquid, starting at the nearest point working away from yourself

Foam fire extinguisher

Water

Removes – heat

How to use – point the jet of water at the base of the flames and keep it moving across the area of the fire

Water fire extinguisher

TIP Do not use a water fire extinguisher on burning liquids as it spreads the fire.

CO_2 gas (carbon dioxide)

Removes – oxygen and heat

How to use – the discharge horn should be directed at the base of the flames and the jet kept moving across the area of the fire

CO_2 fire extinguisher

TIP

- Only hold the insulated horn and handle of a CO_2 gas extinguisher as the brass fittings get extremely cold and could cause freeze burns to the skin.
- Only use where there is adequate ventilation.
- There is little cooling effect, therefore a fire may reignite once the gas is no longer present.

Dry powder (multi-purpose)

Removes – oxygen

How to use – point the jet at the base of the flames and, with a rapid sweeping motion, drive the fire towards the far edge until all the flames are out

Dry powder fire extinguisher

TIP Dry powder fire extinguishers are effective but do leave a powder residue which may damage equipment and cause corrosion of electrical connections.

Fire blankets can be used to smother a fire or wrap around a person if their clothes are on fire.

Fire blanket

FIRE PREVENTION AND CONTROL

Doors and passages must be kept clear and a positive routine established, to be followed in the event of a fire.

Briefly describe the procedure to be followed in the event of a fire in the workshop:

1. Raise the alarm (shout or press emergency button).
2. If the fire is serious call the fire brigade.
3. If possible get assistance.
4. If safe to do so use the appropriate extinguisher to extinguish the fire.
5. Leave by the nearest fire exit in an orderly manner, closing doors behind you and assemble at the designated assembly point.
6. Do not return to the building until instructed to do so by the incident control officer.

FIRST AID

Employers have to assess the first aid requirements of their business. The garage industry is classed as a higher hazard and therefore arrangements for first aid need to be put in place.

Complete the statements using the word bank below:

telephone **remove** **assessment** **move** **danger** **call**

What to do if you are first on the scene of an accident at work:

1. Make an assessment of the situation; ensure that you are not endangering yourself. (Two casualties are not helpful!)
2. If possible remove the cause of injury – e.g., turn off electricity, turn off machines.
3. If you are not a trained first aider, call for a first aider or telephone for an ambulance.

4. Stay with the person to assist the first aider, or if no first aider to reassure the person that help is on the way. Do not attempt to move the person unless they are in immediate danger.

Basic first aid

First aid is best left to personnel trained to carry out this role. If you wish to become first aid trained then talk to your employer about enrolling on a local course.

Useful contacts are:

WWW

https://www.sja.org.uk

http://www.hse.org.uk

http://www.redcross.org.uk

GARAGE WORKSHOP HAZARDS

Examine the drawing of the garage workshop below. Circle the hazards you can find on the drawing and list them in the table opposite. You should be able to circle and list at least 20 hazards.

1 shelf not strong enough for heavy containers

2 barrel not chocked or stood up

3 reaching too high, not able to see contents

4 tyre stack too high and close to door

5 long hair not tied or covered

6 jewellery hanging

7 loose rag in pocket

8 coat too close to electric fire

9 fire unguarded and sitting on a shelf

10 electrical socket overloaded

11 hammer on edge of shelf, could be knocked

12 person smoking in workshop, near flammable liquids

13 spanner could fall from ramp

14 tool box could be crushed under the ramp

15 standing on tip toe on unsafe box

16 no goggles when welding

17 hand too near welding, burn hazard

18 petrol near naked flame

19 mains electric cable under ramp

20 fire extinguisher not mounted correctly

21 oil spill on floor

22 drill on floor

23 inappropriate footwear – sandals

24 unbuttoned overall

WORKSHOP PLAN

Workshop safety familiarization

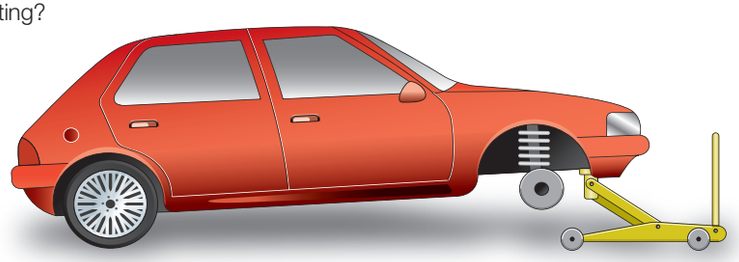
Draw a plan of your college, training centre or company workshop, identifying the following items on your drawing:

- **Fire exits.**
- **Fire alarm points (if fitted).**
- **Position of fire extinguishers and types.**
- **Vehicle hoists.**
- **Bench grinder.**
- **Bench or pillar drill.**
- **Statutory notices (Acts or Regulations e.g., Health and Safety Law or Electricity at Work Regulations).**
- **First aid box.**
- **Hydraulic or mechanical press.**
- **Location of accident book.**
- **Power isolation points.**
- **Exhaust extraction.**

Safe use of machinery and equipment

Many accidents in garages are caused either by the employee not taking adequate precautions or by faulty equipment.

If you were asked to work on the vehicle shown below, what TWO precautions would you take before starting?



Workshop plan

1 axle stands must be positioned correctly under the vehicle

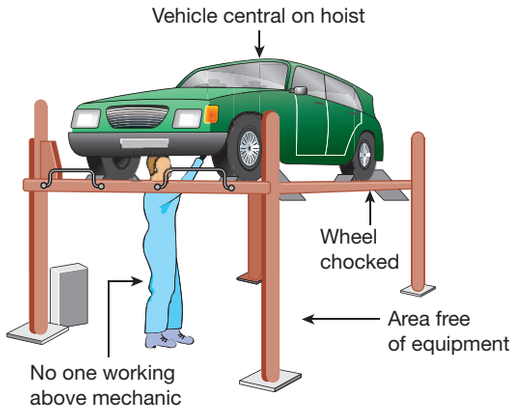
2 the rear wheels must be chocked.

State TWO other precautions that should be observed:

1 the vehicle should be on flat level ground

2 the jack must have suitable safe working load (SWL).

State precautions, other than those shown, that are necessary when working on a vehicle raised by a ramp (hoist):



1 do not exceed safe working load

2 when raising ensure that aerial, bonnet and boot or tailgate are lowered to prevent contact with roof or lights

3 before lowering lift ensure area is clear of people and equipment.

TIP

Only trained staff deemed competent can change the grindstone.

Good posters can still be found in workshops under Abrasive Wheels Regulation (now superseded by PUWER).

Compressed air

Most garages have a compressor to enable air tools and equipment to be used. The storage tank will have the safe working pressure (SWP) marked on the tank. Compressors can often work at 150 PSI (approximately 10 bar).

Pictures supplied by Draper Tools Limited

COMPRESSED AIR CAN KILL!

Serious, sometimes fatal, injuries can be caused by compressed air being injected into the body through the skin or into a body opening, such as your mouth, ear or rectum.

What precautions should be taken when using compressed air equipment?

- never direct a jet of air to any part of the body
- ensure quick release couplings are fully engaged before use
- do not use the air blow gun to clean brake dust from brake components.

State what PPE should be worn when using a compressed air blow gun.

1 goggles

2 nitrile gloves

3 overalls

MOVEMENT OF LOADS

Any heavy object which requires moving manually or by mechanical lifting equipment is considered to be a load. In a large garage or parts department, heavy loads may be transported in the manners shown. Name each method of transport.

1. Fork-lift truck

2. Hand tuck

3. Flat trailer

Which of the above units is loaded correctly? Flat trailer

TIP

When using a sack barrow:

- ensure you walk on level ground
- lean forward slightly
- put your foot on the axle when lowering.

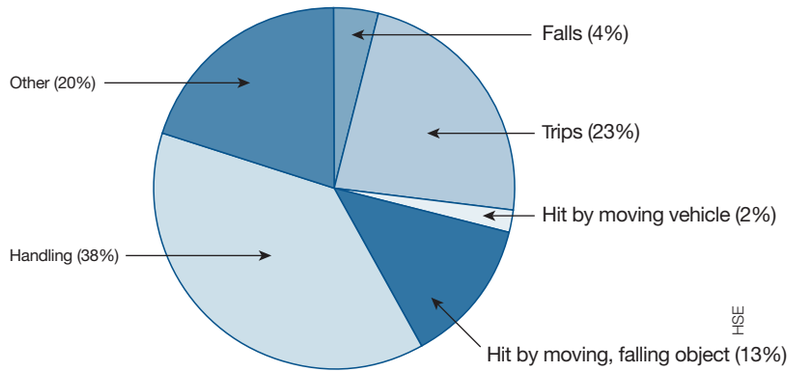
Below is a wheeled bench. When would this bench be good for moving loads in a workshop?

a cylinder head could be removed from the vehicle and placed on the bench for dismantling and transported to the degreasant tank (parts washer)

Sealey Group

Manual handling of loads

More than one-third of all over-three-day injuries (an injury which causes the injured person to be away from work for more than three days) reported each year to the HSE and local authorities are caused by manual handling – the transporting or supporting of loads by hand or by bodily force. The pie chart shows the pattern for over-three-day injuries reported in 2001/02.



Under the Manual Handling Regulations 1992 (amended 2002) employers must:

- **AVOID the need for hazardous manual handling, so far as is reasonably practicable.**
- **ASSESS the risk of injury from any hazardous manual handling that can't be avoided.**
- **REDUCE the risk of injury from hazardous manual handling, so far as is reasonably practicable.**

LIFTING

One person lift (squat lift)

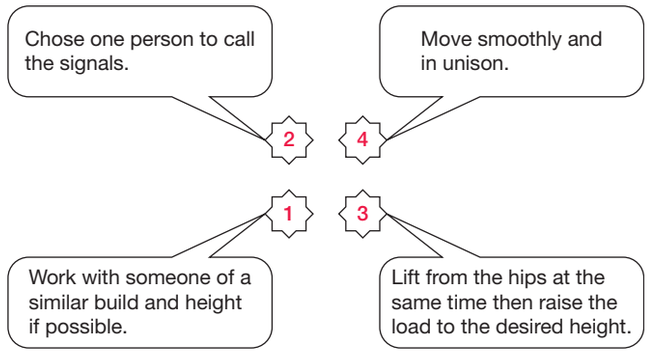
TIP When turning while holding a load move your feet, do **not** twist your body.

TIP When the lift is awkward always ask for assistance.

Whenever possible use lifting equipment.

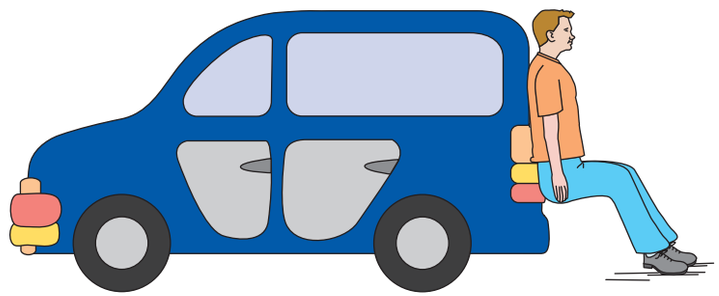
Team lifts

Starting with 1, arrange the following statements in order to give a good team lift procedure.



Pushing and pulling safely

TIP When pushing a car it is better to start the push with your back to the car.



Keep the strain off your back and let your body weight and leg muscles do the work.

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

Generally, the Regulations require that lifting equipment provided for use at work is:

- **Strong and stable enough for the particular use and marked to indicate safe working loads.**
- **Equipment is checked every 6 months by a competent person.**

In your garage, college or training workshop there is likely to be lifting equipment which is covered by these Regulations.

Lifting devices

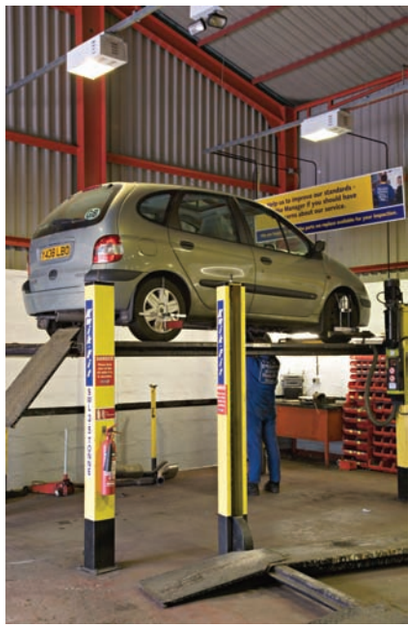
Vehicle hoists (ramp)

State three checks that should be made before using a 4-post ramp to raise a vehicle.

1 check SWL is suitable to lift the vehicle

2 ensure chocks are in place

3 ensure vehicle is positioned centrally.



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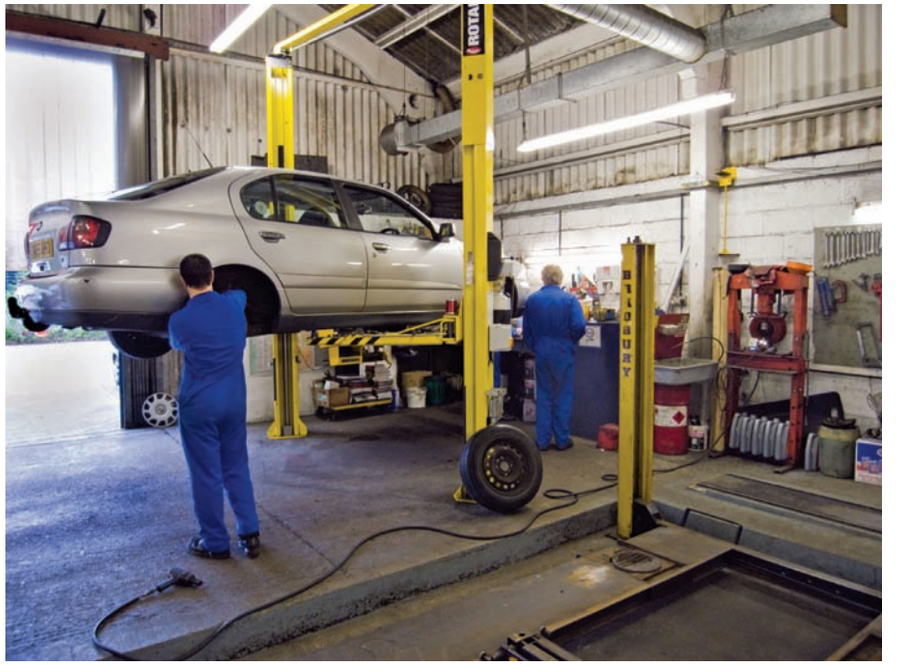

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What would you check before raising a vehicle on a wheel-free or 2-post hoist?

- check SWL is above vehicle weight
- ensure vehicle is positioned so that the centre of weight of the vehicle is in line with the posts
- ensure arms lock out when raised slightly.

TIP

Rear engine vehicles usually need to be reversed on to a hoist or ramp to keep the centre of weight in-line with the posts.

Take care when removing front engine power units as the rear may overbalance.

Trolley jack

Before using a jack check for:

- hydraulic fluid leaks
- wheels move freely and are not damaged.

Give two more checks that should be carried out:

1 jack handle stays up

2 suitable SWL for vehicle to be lifted.

Pictures supplied by Draper Tools Limited

TIP The SWL does not need to be above the vehicle weight as only one end or side of the vehicle is lifted by the jack.

Engine hoist

State four checks to be made before using an engine hoist:

1 suitable SWL marked on hoist

2 checks wheels and castors move freely

3 check for fluid leaks

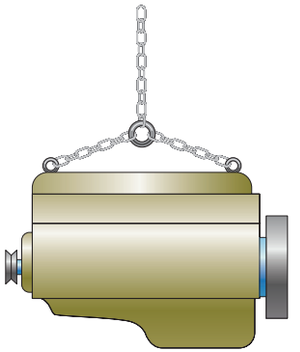
4 check lifting hook for signs of damage

Pictures supplied by Draper Tools Limited

As a general rule any load over 20 Kg requires some form of powered lifting gear to support or move it.

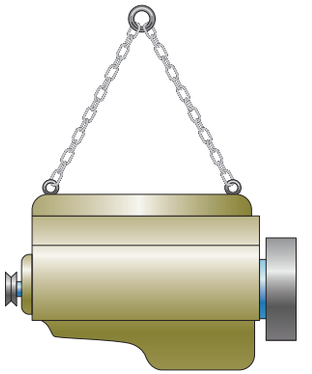
Position of chains and slings

Which is the correct way to lift an engine using a chain sling as shown below?



Please circle

(X) ✓



Please circle

X (✓)

Slings and chains should be checked for wear at least once every 6 months

The angle made by the slings is very important.

What is the maximum recommended angle between the slings? 90

If the angle were to be substantially increased, what would be the effect of the 'pull' on the slings?

each sling could carry a load equal to the weight of the engine

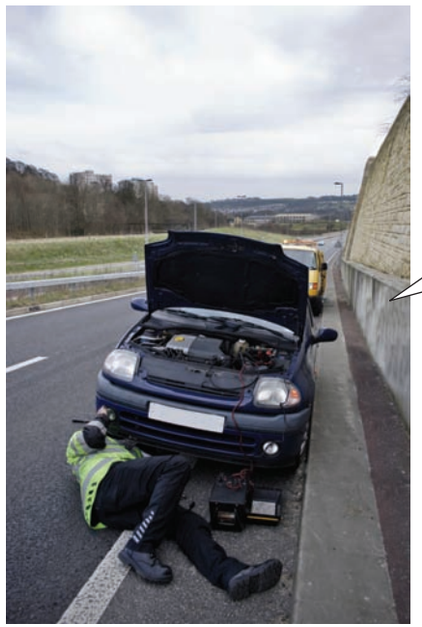
ROADSIDE RECOVERY

Before recovering a vehicle from the roadside you need to have suitable training. Here is a suggested procedure.

During a vehicle recovery or breakdown follow a safe system of working:

- **On arrival switch on hazard warning lights and flashing amber beacon.**
- **Keep back from the broken-down vehicle by at least 10 m.**
- **Turn wheels of the recovery vehicle to the kerb once stationary.**

- **Wear hi-visibility clothing (Hi-Viz).**
- **If the light is poor then carry a switched on torch.**
- **Stay close to the kerb.**
- **Make sure everyone is out of the broken-down vehicle and are safely positioned well back from the kerb on the verge.**



What position should the wheels on this breakdown vehicle be pointing?
turned in towards the kerb

Read the procedure above and answer the following questions.

1 What would be required at the roadside if the light is poor?

Hi-Viz clothing and a torch switched on

2 How far should you park from the broken-down vehicle?

at least 10 m

http://www.avrouk.com

Abbreviation buster

Using your knowledge, complete the following health and safety related abbreviations. They are all contained in this chapter.

HASAWA – Health And Safety At Work Act

PPE – Personal Protective Equipment

COSHH – Control Of Substances Hazardous to Health

PUWER – Provision and Use of Work Equipment Regulations

LOLER – Lifting Operations and Lifting Equipment Regulations

RIDDOR – Reporting of Injuries and Diseases and Dangerous Occurrence Regulations

HSE – Health and Safety Executive

SWL – Safe Working Load

PAT – Portable Appliance Test

SWP – Safe Working Pressure

MSDS – Material Safety Data Sheet

Multiple choice questions

Choose the correct answer from a), b) or c) and place a tick [✓] after your answer.

1 **The Health and Safety at Work Act applies to:**

a) employees only [ ]
b) employers only [ ]
c) all people at work. [✓]

2 **What type of safety sign is shown:**

a) prohibition [✓]
b) mandatory [ ]
c) warning. [ ]

3 The best type of fire extinguisher to be used on an electrical fire is:

a) water [ ]
b) foam [ ]
c) carbon dioxide. [✓]

4 What does the abbreviation COSHH stand for?

a) Control of Substances Harmless to Health [ ]
b) Control of Substances Hazardous to Health [✓]
c) Carrying of Substances Hazardous to Health [ ]

5 What should be done when hazardous products are being used in a workplace?

a) manufacturer's data sheets obtained from supplier [ ]
b) risk assessments carried out for products used [ ]
c) all the above. [✓]

6 What will happen if compressed air is forced through the skin?

a) death if air is forced into the bloodstream [✓]
b) skin irritation [ ]
c) come out in a rash. [ ]

7 If you discover someone who has suffered an electric shock, what is the first thing you would do?

a) rush over and drag them out of the workshop [ ]
b) turn off the power [✓]
c) hit the fire alarm button. [ ]

8 When attending a broken-down vehicle on the motorway when it is dusk you should:

a) wear light-coloured overalls and carry a torch [ ]
b) wear Hi-Viz clothing and carry a switched on torch [✓]
c) use a flashing red torch. [ ]

9 All employers must have a written health and safety policy. True or false?

a) true [ ]
b) false. [✓]

10 On inspection of a mains electric drill, you notice the coloured wires showing as the flex leaves the plug. You should:

a) carry on using it as the coloured wires are insulated [ ]
b) not use the drill and report to your supervisor [✓]
c) wrap some insulation tape around it. [ ]