



## Welcome to the safe@work Automotive Module.

Have you read the General Module, completed the test and gained your safe@work General certificate?

The Automotive Module should be done AFTER the General Module or Review Module.

If it is some time since you completed the General Module, you should read the Review Module. The test for the Automotive Module contains some questions based on the Review Module.

There are common hazards in the automotive industry. It is important to learn about these hazards and how they can be controlled so people at work are not exposed to risk.

The Automotive Module contains information on:

- Plant
- Powered Tools and Hand Tools
- Hazardous Substances and Dangerous Goods
- Confined Spaces
- Manual Handling
- Slips, Trips and Falls
- Noise

Within the automotive industry, workers undertake jobs such as:

- repairing and overhauling engines
- changing tyres
- degreasing vehicle parts
- panel beating
- removing and replacing damaged windscreens
- mending leaking hoses and radiators

You may be asked to assist with some of these tasks while taking part in work experience.

Your employer must explain each task *before* you start work on it. You must be provided with instruction, training and supervision. You must know the first aid and emergency arrangements too, so if anything goes wrong you will know what to do.

### Key Point

It is important that your employer has taken action to control risks. You must know and follow safe working procedures – not just for your own safety, but also for the safety of others working with you.



## Plant

**Note:** Students taking part in work experience programs must **NOT** operate hazardous plant. This information is designed to give students an understanding of some of the hazards, and the steps taken to control risks, in the painting industry.

Plant is another word for machinery – it does *not* refer to hand tools or small (hand-held) power tools.

In the automotive industry, **hoists** are used to elevate vehicles so repairs can be made safely by people working beneath the vehicle. The safe operation of hoists is essential, and depends upon competent operators and strict maintenance and inspection routines. Every hoist must be subject to a pre-operation check, and routine inspection and maintenance must be carried out at least every three months.

Other plant commonly used in automotive workshops includes **air compressors** and **overhead cranes** to remove engines from vehicles and move other heavy items around the workshop. Their use can result in serious injury if safe work and maintenance practices are not followed.

Air compressors are dangerous items of plant, and should never be used to blow dust or dirt from clothing or work materials. Compressed air accidentally blown into an open wound can prove fatal.

Because **asbestos** has been used in some vehicle components such as brake lining, there is the possibility that asbestos fibre may be found in automotive workshops: compressed air should never be used to blow what may appear to be dust from these items.

**Vehicles** themselves are mobile machines, and also present significant risks to people: the movement of traffic around an automotive workshop must be managed safely. Members of the public should not be allowed to enter the work area unsupervised.

Engines have exposed moving parts (fans and belts) which could catch fingers, and exhaust emissions can be fatal if they build up in an enclosed area.

If a vehicle moves while a worker is beneath it, a fatality or serious injury could result. Safe work systems will ensure this cannot happen, by:

- removing keys from the ignition: if the worker keeps them while the job is carried out, the vehicle cannot be started
- making sure the hand brake is on
- immobilising the wheels on both sides of the vehicle with purpose built wheel chocks
- raising the vehicle on a pillar hoist, so all four wheels are off the ground.

When hazards cannot be eliminated or sufficiently reduced by engineering controls or safe working procedures alone, you may need to wear personal protective equipment (PPE) to improve protection.



PPE may include safety glasses or goggles, earplugs or earmuffs, protective gloves, overalls or other close fitting clothing. Safety shoes or boots with reinforced toe-caps will protect your feet if any heavy or sharp items are dropped.

#### **Key Point**

Personal protective equipment (PPE) is a 'last resort' when hazards cannot be managed by other measures. Employers should first try to eliminate the hazard or reduce the risks at their source.

#### **Your employer must:**

- have a maintenance program to make sure all plant and equipment is in safe working order
- train workers to use plant and equipment, and make sure they are supervised.
- provide any PPE needed and show workers how to use it correctly.

#### **What employees should do:**

When operating any mechanical equipment, employees must follow safe work procedures as instructed by the employer or supervisor.

These may include:

- wearing any personal protective equipment provided
- using tools and equipment correctly and safely as they have been trained to do
- switching off machinery and equipment when it is not in use
- concentrating on the job – distractions can contribute to injuries
- keeping the work area around plant and equipment clean, and free from slip and trip hazards.

### ***Powered Tools and Hand Tools***

**Note:** Students in work experience programs must **NOT** operate powered tools. This information is designed to give students an understanding of the hazard and some of its risk control measures.

Many of the tools used in the automotive industry are powered by electricity. Your employer must make sure all electrical machinery and equipment is kept in good working order.

Electrical plugs and switches must be checked regularly to make sure they are not damaged. Leads can become split or frayed, and these too must be inspected for wear each time they are used. Electrically powered tools must be tested and tagged regularly.

#### **Key Point**

Any powered tool which appears faulty or damaged must be immediately withdrawn from use – it should be tagged (FAULTY – DO NOT USE) and removed from the workshop until it has been repaired.



Instructions for the safe use of powered tools and electrical equipment must be followed closely. These should include:

- switching off powered tools and electrical equipment at the power point before you pull out the plug
- disconnecting broken appliances – *do not use* if cords or power points are damaged
- not overloading power points by “piggy backing” appliances
- keeping electrical leads off the floor – to reduce the risk of contact with fluids or sharp objects, and to prevent wear as a result of dragging across rough surfaces.

Hand tools – such as spanners, wrenches and screwdrivers – will be used in every job. The most common injuries from use of hand tools are to the hands and fingers. Using the correct tools is an important way to avoid these injuries.

If you are asked to carry out work using hand tools, you should be given training in how to use them. Don't hesitate to ask for assistance if you feel you have the wrong tool for the job.

### ***Hazardous Substances and Dangerous Goods***

The automotive industry requires the use of dangerous goods (such as petrol and gas) and hazardous substances (such as acids, oils, diesel and solvents).

**Petrol containers** and **gas cylinders** must be stored securely, away from heat sources and out of the path of vehicle traffic. These are highly flammable substances and could cause fatality and serious injury if not carefully handled and stored.

**Solvents** are often used as cleaners or degreasers. They can enter the body when a person breathes in their vapour, through skin contact, or through the mouth from contact with food or fingers.

Solvents can impair memory and cause headaches, dizziness, fatigue, mood changes or nausea. Exposure to high levels of solvents can cause liver damage, unconsciousness, death and cancers.

**Spray paints** contain harmful substances. Inhaling paint fumes may cause occupational asthma. Long term exposure can affect the brain, damage the reproductive system and cause kidney or liver damage. Contact with the skin may cause dermatitis (an inflammation of the skin).

**Batteries** contain acid and must be treated with caution. If you are asked to handle batteries, you must be given instruction and provided with appropriate PPE – rubber gloves, eye protection (you may need goggles to avoid splashes), overalls and solid work boots. (You should always wear work boots – *not* sneakers or soft shoes – in the automotive industry, no matter what job you are doing.)

**Welding** operations generate hazardous fumes and should be separated from other workshop activities and from workers who may not be protected by fume extraction systems, ventilation or appropriate PPE. It may be possible to weld out of doors in good weather; at all times, risk controls will be needed to prevent exposing the welder and other workers to risk.



**Dust** is caused by jobs like sanding, sweeping, grinding and cutting. Small metal pieces can be generated by cutting and sanding operations, and Your employer can reduce dust by using machines that are enclosed or fitted with local exhaust ventilation.

#### **Key Point**

Your employer must make sure you use hazardous substances and dangerous goods according to the manufacturer's written instructions provided on the material safety data sheet (MSDS) and the agreed safe work procedures.

#### **You should:**

- always follow safety procedures
- *not* use solvents to clean your hands
- *not* enter confined spaces where exhaust fumes may have collected
- wear correct personal protective equipment provided, such as a mask, protective overalls, suitable gloves and safety glasses.

### **Confined Spaces**

**Note:** Students in work experience programs must **NOT** enter confined spaces. This information is designed to give students an understanding of the hazard and some of its risk control measures.

Some automotive workshops have pits to enable work to be done if a hoist is not available. The vehicle is driven over the pit, and the mechanic works from beneath. This work should never be done by someone working alone: a second person should be on hand (outside the pit) to monitor the work and to provide assistance

Because carbon monoxide (from the vehicle exhaust) is heavier than air, the fumes may build up in the 'confined space' under the vehicle. These fumes need not be only from the vehicle being worked on: if other engines are running nearby, there is still a significant risk of exhaust emissions collecting in the pit.

Good ventilation is essential in automotive workshops. Engine bay doors should be fully open at all times. If weather conditions prevent this, the work must be evaluated and tasks such as spray painting, which could result in a build-up of fumes, should be postponed.

Respirators will be necessary for a number of jobs in an automotive workshop. Dust masks do not provide protection against vehicle fumes and gases, or paint drift from spraying operations. Employers must find out what kind of breathing protection is needed and make sure all workers are issued with it and instructed in its correct use.

#### **Key Point**

Work in confined spaces can be extremely hazardous. Employers must assess the risks and make sure there is no possibility that anyone working beneath a vehicle could be exposed to carbon monoxide.



## Manual Handling

Lifting and moving equipment and materials, panel beating, and working in awkward postures (such as removing or replacing engine parts under car bonnets) are some examples of manual handling tasks you may have to do in the automotive industry.

At times, your work tasks may involve bending and stretching as well as twisting sideways, or working with materials and equipment above shoulder height. All of these increase the risk of manual handling injury.

It is your employer's responsibility to assess and control manual handling tasks that may present risk, and to provide instruction, training and supervision for manual handling activities.

Risk controls may include:

- organising the work to reduce the number of manual handling tasks involved
- providing mechanical lifting devices such as trolleys, hoists and overhead cranes where appropriate
- making sure you do not work long shifts involving manual handling activity
- making sure the workplace layout allows enough space to move and work safely and comfortably.

Lifting equipment will be necessary for many of the tasks in an automotive workshop. Many engine parts are too heavy to lift safely, and storage of items such as vehicle tyres on racking, while it may be easy at ground level where they can be rolled in, presents manual handling risk if you attempt to lift them.

If lifting equipment is not available, the job may require a "two-person lift".

### Key Point

You must talk to your employer or supervisor if you find a job is too heavy or too difficult, or if you feel it may put you at risk of injury.

## Slips, Trips and Falls

A slip or fall can cause injury to the arms, legs, back, neck or head. Neck and head injuries can cause damage to the spinal cord and nervous system. Many employees have suffered permanent disabling injuries as a result of a fall.

### Key Point

Slippery floors in the work place are a serious hazard and can result in far more serious accidents than simply slipping and falling over.

Poor 'housekeeping' in the automotive industry leads to slips, trips and falls. Oil spills, engine parts, air lines and hoses left on the workshop floor can all result in preventable accidents. Metal bins should be provided for waste disposal. These should not be allowed to overflow.



Your employer can reduce the risk of slips, trips and falls by providing a suitable non-slip floor surface, good lighting and safe work procedures.

You must follow instructions and safe work procedures provided by your employer, which may include:

- sweeping things like metal shavings up regularly
- cleaning all spills immediately – oil spills should be soaked up with a dry absorbent, and then put into a waste container
- making sure there are no trailing electrical cords on the floor
- keeping the workshop floor free of equipment, vehicle parts, tools and rubbish.

### **Noise**

Employees in the automotive industry work with noisy tools and machinery such as wheel removers, compressors, grinders and drills. While in an automotive workshop, you may be exposed to noise levels exceeding 85 decibels or dB(A) that could lead to hearing loss.

The employer can reduce noise levels by isolating noisy machinery from employees not involved in its operation. Enclosing the source of the noise in a sound absorbing box, or erecting sound absorbing barriers, will help. And by keeping machinery and equipment in good order so it operates efficiently, noise can be considerably reduced.

If the noise cannot be removed at its source or sufficiently reduced by other means, your employer must provide personal hearing protection (earmuffs or earplugs) in addition to other risk controls.

#### **Key Point**

Earpieces for portable radios and music devices do not provide protection from loud noise.

### ***Self-Assessment Questions***

Now try the self-assessment questions.

There are 16 questions. If you get 12 or more correct you will be awarded a safe@work Certificate. The Principal of your school will then sign the certificate and validate it with the school stamp.