

13 December 2016

Coroner Jamieson  
Coroners Court of Victoria  
65 Kavanagh Street  
Southbank VIC 3006

Dear Coroner Jamieson

**Name of Deceased:** Lloyd HILL  
**Coroners' Court Reference:** COR 2015 004278

I refer to Your Honour's findings and recommendation published in relation to the death of Lloyd Hill, and sent to WorkSafe Victoria (WorkSafe) on 14 September 2016.

Your Honour recommended that:

- WorkSafe Victoria reviews its role in raising awareness amongst the Victorian community of important safety precautions for people engaging in 'do-it-yourself' motor vehicle repairs.

I am pleased to advise that Your Honour's recommendation will be implemented.

WorkSafe has liaised with the Australian Competition and Consumer Commission (ACCC) and extended our assistance to promote safety precautions for do-it-yourself motor vehicle repairs. We have agreed that the safety of do-it-yourself motor vehicle repairs will be included in the ACCC 'safe summer' social media campaign proposed for January 2017.

WorkSafe's assistance has been welcomed and the ACCC will advise WorkSafe once the campaign goes live so that WorkSafe can assist in promoting the ACCC's campaign through our own social media channels.

WorkSafe produces a guide to automotive workshop safety (the guide). A copy has been included for Your Honour's reference. Although WorkSafe's primary focus is safety and prevention in the workplace, the guide can be used to assist with the identification of risks associated with motor vehicle repairs.

WorkSafe will continue to be proactive with raising awareness in the community to convey safety messages.

If you require any further information, please do not hesitate to contact Mai Pham, Coronial Lawyer, on 9940 4828.

Yours sincerely



Clare Amies  
**Chief Executive**  
**WorkSafe Victoria**





WORKSAFE VICTORIA

# AUTOMOTIVE WORKSHOP SAFETY

April 2004

**A GUIDE TO AUTOMOTIVE  
WORKSHOP SAFETY**  
**Fix the Risks**





## CONTENTS

Status of this Guide .....	1
How to use this Guide .....	2
The extent of the Problem – an overview of automotive workshop injuries .....	3
WorkSafe's Expectations .....	4
Working Around Vehicles – the workshop .....	5
Working Around Vehicles – other workplaces .....	7
Roadside Maintenance Activities .....	10
Lifting Equipment .....	12
Storage and Racking of Parts .....	15
Awkward Postures .....	17
Handling Heavy Parts .....	20
Handling Asbestos – motor vehicle products .....	21
Fitting Tyres and Wheels .....	27
Automotive Workshop Inspection Checklist ..	37
Further Information .....	39

## INTRODUCTION

Too many people are injured while working in automotive workshops or carrying out off-site service calls.

Manual handling injuries are the most common type of injury occurring in automotive workshops. The injuries occur from handling heavy or awkward objects, heavy lifting, and prolonged or sustained work in awkward postures. This injury trend occurs across all types of vehicle repair, maintenance or installation work, and on all types of vehicles.

Given the nature of the work there is always the risk of severe injury or fatality. Some risks are obvious, such as vehicles falling from hoists or jacks, being hit by a passing vehicle while carrying out roadside work, or tyres exploding during inflation. Other risks are less obvious such as the long-term effects of breathing asbestos fibres or fumes from solvents and automotive paints. While there may be risks associated with this type of work, these risks **can** be avoided.

Employers have a duty to minimise the risk of injury at their workplace. This duty is set out in detail in the Occupational Health and Safety Act 1985. Under this Act an employer can be held responsible for the safety of the workshop (workplace), its equipment and its contents, the safety of the systems of work used by employees and the proper training and supervision of employees to keep them safe at work. Regulations made under the Act provide additional instruction on how particular hazards, such as asbestos, hazardous substances, manual handling and plant, are to be managed.

Employees also have a duty to take reasonable care for their own health and safety at work and to avoid endangering the health and safety of any other person by anything they do, or fail to do, at the workplace.

Guidance material is available from WorkSafe that may help employers fulfil their obligations. Other sources of information include your industry association, suppliers and manufacturers' advice, Australian Standards, training courses, advice from consultants, experienced practitioners, unions, insurers, rehabilitation providers, legal practitioners, researchers, inventors, auditors and others. Together these contribute to the 'state of knowledge' about hazards in automotive workshops and how to eliminate or control them.

After consulting widely with industry, inspecting many workshops and investigating many incidents, WorkSafe has developed this Automotive Workshop Safety Guide to help employers and their employees develop solutions to the more difficult hazards. For many hazards described in this guide, a key part of the solution is investment in mechanical aids that make the job easier and safer (Refer to the section **WorkSafe's Expectations** on page 4 of this guide)



## STATUS OF THIS GUIDE

WorkSafe's guidance material contributes to 'the state of knowledge about hazards and risks and the ways of removing or reducing the hazard and risk'; these are two elements of the definition of 'practicable' which qualifies the extent to which an employer's obligation, under provisions such as section 21 of the Occupational Health and Safety Act (1985), must be met.

An employer should consult any relevant published guidance material when addressing hazards and risks. However, information in published guidance material, including material published by WorkSafe, is not necessarily the only way in which a hazard or risk may be adequately addressed. Whichever approach is used, it is important to apply the principles on page 4.

**Practicable:** means considering all of the following

- the severity of the hazard or risk in question
- the state of knowledge about that hazard or risk and any ways of removing or mitigating that hazard or risk
- the availability and suitability of ways to remove or mitigate that hazard or risk and
- the cost of removing or mitigating that hazard or risk.

ELEMENT OF PRACTICABLE	RELEVANCE OF THIS GUIDE TO PRACTICABILITY
<i>The severity of the hazard or risk in question.</i>	Refer to The problem on page 3 which describes claims data for injuries resulting in more than ten days off work, or \$466 compensation
<i>The state of knowledge about that hazard or risk and any ways of removing or mitigating that hazard or risk.</i>	This Guide reflects part of the state of knowledge about the risk and controls in place within industry to control the risk. Readers are referred to other sources of knowledge
<i>The availability and suitability of ways to remove or mitigate that hazard or risk.</i>	This Guide identifies a range of available approaches and equipment suitable for controlling risk, and lists other useful sources of knowledge
<i>The cost of removing or mitigating that hazard or risk.</i>	Many employers have found it is practicable to implement the controls detailed in this Guide and in the other sources of knowledge referred to



# HOW TO USE THIS GUIDE

This Guide can be used for

- understanding the extent of the problem – injury to people working in automotive workshops
- understanding WorkSafe's expectations
- a reference to other sources of information
- a source of specific guidance including the hazards described in the Comparative Charts.

## Comparative Charts

The comparative charts in this Guide provide detailed guidance about particular problems and safety solutions. A 'traffic light' format assists you to identify high risk activities and assess your workplace to implement safer work practices.

If 'red' practices are used in your workplace you should first see if you can implement the practices in the green column straight away. If that isn't practicable you should immediately put in place the comparable practices in the amber column as an interim solution.

HIGH RISK	MEDIUM RISK	LOW RISK
The practices in red column should not be used in workplaces, an employer who allows those practices to be used is likely to be in breach of OHS legislation	The practices in amber column are less effective in reducing risk as compared to the green column, and should be treated as interim solutions only	The practices in green column should be regarded as the target for all workplaces

---

**Consider the activities in your workplace in each of the Comparative Charts. Are you in the red, amber or green? If you are in the red or amber, then go for practices in the green!**

By assessing how safely your workplace rates in the Comparative Charts for the activities in your workplace, you will have a sound basis for risk assessment and development of risk controls. The Comparative Charts also allow you to judge the effectiveness of your current risk assessments and controls.

---

**The best solutions are those that use engineering, design, physical changes and similar permanent methods, as compared with methods that require a high degree of supervision and monitoring for success. Has your risk assessment process led you to implement such permanent control methods?**

---



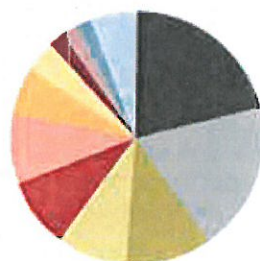
## THE EXTENT OF THE PROBLEM - AN OVERVIEW OF AUTOMOTIVE INJURIES

With an incidence rate of 3.2 WorkCover claims for every 100 employees each year, the automotive workshops sector has one of the worst claims rates in the trade sector. In the 2001/2002 financial year, 430 claims were lodged where the injured person was off work for more than ten days or the medical and like costs were over \$466. Each year, one in every fourteen workplaces lodges claims with WorkCover for such serious injuries.

Each claim costs an average \$40,500. Some injuries cost more - on average the back injuries reported to WorkCover were over \$64,000 and body stressing injuries (sprains and strains) averaged over \$50,000 per claim.

For mechanics this means there is a good chance, over a forty-year career, of suffering a serious injury. Quite possibly this will be a body stressing injury, eg a back claim. For workshop managers this means that unless you manage workshops with injury prevention in mind, your 'normal business' is likely to include handling WorkCover claims from staff.

### BODY STRESSING IN AUTOMOTIVE WORKSHOPS



- ◆ Awkward posture or repetitive strain while using tool
- ◆ Handling vehicle parts or heavy objects eg suspension components, batteries, brake assemblies, etc
- ◆ Handling objects such as engines, radiators, gearboxes, transmissions, mufflers
- ◆ Awkward, repetitive or static posture during maintenance
- ◆ Handling other large vehicle parts or heavy objects (except wheels, tyres, engines, radiators, gearboxes and transmissions)
- ◆ Handling wheels or tyres
- ◆ Handling items such as boxes or containers etc
- ◆ Awkward, repetitive or static posture in office, warehouse, amenities - not vehicle related
- ◆ Washing a vehicle or vehicle part or detailing vehicle
- ◆ Floor, housekeeping, slip or trip while carrying things around
- ◆ Pushing or pulling vehicle
- ◆ Other body stress issues (various minor)

Information in this chart is based on analysis of 'free text' fields in 589 claims in the 3 financial years 1999-2002.

Manual handling injuries are the most common type of injury occurring in motor vehicle workshops. The injuries occur from handling heavy or awkward objects, heavy lifting, and prolonged or sustained work in awkward postures. This injury trend occurs across all types of vehicle repair, maintenance or installation work, and on all types of vehicles. These body stressing injuries make up 47% of all reported injuries.

The next most common category of injury is slips, trips and falls, usually from floors in substandard condition. This is 14% of all claims and is solved by good layout/design and good housekeeping. Compared to other industries the rate of injuries due to bullying is high at 2% of all claims. These injuries are easily preventable. Owners and workshop managers are directed to WorkSafe's guidance material on preventing bullying and violence in the workplace.

Fatal accidents are devastating and while the young and inexperienced are most at risk, experienced workers, and in some cases employers, have been the victims. In almost every instance a chain of events is put into place that ultimately leads to tragic consequences. Breaking this chain at an early stage will prevent this outcome.

Some examples of fatal accidents that have occurred in recent years are

- vehicle hoist failed, car fell on mechanic (multiple occurrence)
- truck was supported on wooden blocks at front with drive wheels in contact with ground engine was started with gearbox in gear while mechanic was underneath
- tyre fitter was struck by split rim assembly while inflating tyre
- business owner working under an unsupported tipper truck tray was crushed when the hydraulic controls were activated
- mechanic carrying out roadside repairs was struck by a passing vehicle.

APRIL 2004



# WORKSAFE'S EXPECTATIONS

Given the size of the problem and the nature of the risk, WorkSafe expects that employers will apply the following principles to address health and safety problems in automotive workshops.

## **1: Do not rely on safe behaviour as the main means of preventing injury**

Safety solutions that rely on administrative controls such as training, supervision, and procedures, require constant vigilance and effort to maintain. Physical changes such as improved workplace layout do not require the same level of effort and are more effective and a sustainable means of injury prevention.

## **2: Use mechanical devices to reduce heavy lifting, awkward postures, sustained postures and other body stressing**

Many mechanical devices are already in use, such as tools powered by compressed air, hoists, cranes and lifting hooks, bead breakers, and body underslides to get under vehicles. Some devices are widely known but used less often, such as vacuum lifters for windscreen insertion, using hoists when detailing, hip-height roller conveyor and ramps to load and move tyres, order picking ladders with load tables for stock access, pads and body tables for comfortable work in footwells and under dashes and castors on heavy toolboxes. A few workplaces apply innovative ideas such as tyre underslide and using overhead-mounted body support harnesses for work over the engine bay. If the equipment exists to reduce the risk of body stressing then it should be purchased and used.

## **3: Search widely for solutions and challenge 'that's the way it has always been done'**

Because people do not expect to go home injured or maimed from work, what people accept as 'the normal way of doing things' has changed. Managers, owners and employees need to recognise this. For example, for working safely with axle stands and jacks the Australian Standards are the reasonable best starting point, however some automotive workshops do not apply the safety standards in these documents.

## **4: Apply the knowledge in this document**

For the hazards in the Comparative Charts, go for green. For other things that can injure people, obtain and apply the knowledge of the hazards and how to solve them.



# WORKING AROUND VEHICLES – THE WORKSHOP



Low risk example. A neat and tidy workshop area.

**Hazards include:** moving vehicles that may cause injury to employees and members of public.

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Managing traffic at the workplace</b>	<p>No traffic management plan for work in the workshop, car parks or footpaths. Traffic management in these situations is ad hoc, eg</p> <ul style="list-style-type: none"> <li>no exclusion zones marked or barriers provided</li> <li>customers drive their own vehicle within workshop</li> </ul>	<p>Documented traffic management plan and signage which only allows customers to drive their vehicle when under direct supervision, eg</p> <ul style="list-style-type: none"> <li>areas indicated by painted lines</li> <li>customers are supervised when they move their vehicle within workshop</li> </ul>	<p>Documented traffic management plan and signage which does not permit customers to drive their vehicle within a workshop, eg</p> <ul style="list-style-type: none"> <li>customer service area for vehicle drop-off</li> <li>employee moves vehicle out of workshop and into customer car park/pick up area.</li> </ul>
<b>Work areas</b>	<p>No designated work area, work is done inside or outside workshop, eg on footpaths or road</p>	<p>Work is done on-site in designated vehicle parking area</p>	<p>Vehicle traffic is physically segregated from service personnel and pedestrians.</p>
<b>Planning for pedestrian traffic</b>	<p>No pedestrian management system in place</p>	<p>Customer remains on-site in specified area</p>	<p>Designated customer parking bays.</p> <p>'No unauthorized access' signs erected at all entry points to workshop.</p>
<b>Driving vehicles</b>	<p>Employees and others drive outside of their licence conditions or level of competence, eg</p> <ul style="list-style-type: none"> <li>road testing of vehicles by unlicensed drivers</li> <li>people drive within their licence requirements but with unfamiliar vehicles without induction, training or supervision</li> </ul>	<p>When working on trucks, trailers, earth moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>customer is supervised in moving the vehicle</li> </ul>	<p>Employees drive within their licence and competency.</p> <p>When working on trucks, trailers, earth moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>vehicle dropped off and moved to designated repair area by licensed operator with appropriate experience.</li> </ul>



# WORKING AROUND VEHICLES – THE WORKSHOP

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Preventing vehicles from moving</b>	<p>Only one or no method used to prevent vehicle from moving</p>	<p>Vehicle is prevented from moving by using two of these methods</p> <ul style="list-style-type: none"> <li>• keys are removed from the ignition</li> <li>• the hand brake is on</li> <li>• wheels are chocked on both sides of the vehicle using serviceable purpose-built chocks</li> <li>• vehicle raised on a pillar hoist with all wheels off the ground</li> </ul>	<p>Vehicle is prevented from moving by using three of these methods</p> <ul style="list-style-type: none"> <li>• keys are removed from the ignition</li> <li>• the hand brake is on</li> <li>• wheels are chocked on both sides of the vehicle using serviceable purpose-built chocks</li> <li>• vehicle raised on a pillar hoist with all wheels off the ground</li> </ul>
<b>Preventing slips and trips</b>	<p>Long leads required to reach from power outlets</p> <p>Leads strewn across workshop</p> <p>Spills/wet patches not cleaned up Absorbent material not available</p> <p>Floor surface slippery when wet, or uneven with cracks and holes</p>	<p>Absorbent materials stored on site in case of spill</p> <p>Floors cleaned daily or weekly</p> <p>Workers are encouraged to report tripping hazards in floor surfaces</p>	<p>All leads are stored out of the way, eg retractable reels</p> <p>Power and pneumatic outlets located close to the service area</p> <p>Spills, including water spills, are covered with absorbent material and immediately cleaned up</p> <p>A non-slip surface coating is applied to potential slippery surfaces, eg steps</p>



# WORKING AROUND VEHICLES - OTHER WORKPLACES

**Hazards include:** moving vehicles and plant in close proximity to mechanic/tyre fitter. The mechanic/tyre fitter may be unfamiliar with workplace site conditions and equipment. Drivers and plant operators may be unaware that the mechanic/tyre fitter is working on their vehicle or plant.

These control measures are applicable to all vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Managing the safety of the employee on service calls to other workplaces</b>	Neither the employer or the host employer takes responsibility for the on-site health and safety of the mechanic/tyre fitter at the worksite		At the time of contracting the work the employer of the tyre fitter/mechanic and the host employer discuss and agree on how the health and safety and supervision of the employee will be managed. Both employers take responsibility for the safety of the tyre fitter/mechanic and develop safe systems of work that will apply for the duration of the job
<b>Conditions at the work location</b>	<p>Work is done wherever the vehicle is located without regard to site conditions</p> <p>Work is carried out on unsafe work surfaces, including</p> <ul style="list-style-type: none"> <li>a surface that is steep, unstable, loose, slippery, boggy or has soft edges</li> <li>a surface that is too thin or weak to bear a load or a lifting device</li> <li>an area subject to exposure to harmful chemicals or other risks, eg hazardous work operations</li> </ul> <p>Lighting is inadequate to safely do the job</p>	<p>Work takes place on a flat even surface that is able to bear the general load of the vehicle</p> <p>Lighting is adequate to see to do the job</p> <p>In unsafe work locations, vehicles are relocated to a safer position</p> <p>Other risks are not assessed or controlled, eg</p> <ul style="list-style-type: none"> <li>site/vehicle condition</li> <li>presence of dangerous chemicals or equipment</li> <li>electrical safety, eg overhead cables</li> <li>site traffic conditions</li> </ul>	<p>Work takes place on a flat even surface that is able to bear the general load of the vehicle, and is able to bear the point load of jacks/lifting equipment.</p> <p>Lighting is sufficient that detail work (such as reading gauges) can be readily carried out.</p> <p>Other risks are assessed and controlled, eg</p> <ul style="list-style-type: none"> <li>site/vehicle condition</li> <li>presence of dangerous chemicals or equipment</li> <li>electrical safety, eg overhead cables.</li> </ul> <p>Procedures are in place and used that require vehicles to be relocated, eg towed to a safe location</p>
<b>Planning for vehicle traffic</b>	Work is performed without sufficient regard for the traffic operations at the site. Mechanics/tyre fitters are exposed to the risk of injury by site traffic or moving plant	<p>Work is performed in a defined safe work zone where site operations, vehicle road speed and driver reaction times of oncoming vehicles or plant has been considered</p> <p>The safe work zone is marked by</p> <ul style="list-style-type: none"> <li>warning cones or warning triangles</li> <li>flashing light on service vehicle</li> <li>mechanic/tyre fitter wears a high-visibility vest/clothing</li> </ul>	Vehicles are moved to a safe area that is remote from site traffic and plant before work commences.



# WORKING AROUND VEHICLES - OTHER WORKPLACES

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Preventing vehicles from moving</b>	Vehicle immobilisation is ineffective, eg only the hand brake is applied and engine can be started while mechanic/tyre fitter is working on vehicle	<p>The vehicle is prevented from moving by two vehicle immobilisation methods, eg</p> <ul style="list-style-type: none"> <li>the hand brake is on</li> <li>wheels are chocked on both sides of the vehicle using available site materials</li> </ul> <p>The keys are removed from the vehicle's ignition and secured</p> <p>A conspicuous warning sign is placed in or on the vehicle where potential drivers will see it stating, eg <i>Danger - mechanic/tyre fitter under vehicle Do not start</i></p>	<p>The vehicle is prevented from moving by using three or more vehicle immobilisation methods, eg</p> <ul style="list-style-type: none"> <li>the hand brake is on</li> <li>wheels are chocked on both sides of the vehicle using serviceable purpose-built chocks</li> <li>the keys are removed from the vehicle's ignition and secured</li> <li>a lockout system integrated with the customer's procedures is in place to prevent the vehicle from being started or the vehicle or any part of it being inadvertently moved</li> </ul> <p>Vehicle driver fully aware of the mechanic/tyre fitter's presence and requirements</p>
<b>Vehicle payload stability</b>	<p>Tyre changing or wheel/brake servicing work is carried out when the payload is unstable</p> <p>Vehicle is raised to a height that endangers vehicle stability</p>	<p>Payload is stable before tyres are changed or wheel/brake servicing is carried out, eg</p> <ul style="list-style-type: none"> <li>liquid in tanks stopped moving</li> <li>cattle in livestock carrier settled</li> </ul> <p>Vehicle is raised to the minimum height to allow for tyre/wheel removal</p>	Vehicle is unloaded or load is reduced to a safe level prior to the commencement of tyre changing or wheel/brake servicing work
<b>Availability of lifting aids to lift/manage heavy objects</b>	Lifting equipment suitable for the task is not supplied by employer and is not available on site. Tyre fitter/mechanic manually handles heavy objects, eg truck wheels, brake drums, etc	Mechanic/tyre fitter is provided with manual handling aids at the host workplace. The suitability of this equipment is not assured by risk assessment process	Mechanic/tyre fitter is equipped with a range of manual handling aids appropriate to the tasks to be undertaken, eg wheel dolly, brake drum lifter.



# WORKING AROUND VEHICLES - OTHER WORKPLACES

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Use of on-site equipment</b></p>	<p>Mechanic/tyre fitter uses on-site equipment</p> <ul style="list-style-type: none"> <li>• without the host employer's permission</li> <li>• without the mechanic/tyre fitter having been trained in the safe use of the equipment</li> <li>• without a certificate of competency for the equipment, where this is required</li> </ul>	<p>Host employer permits the use of on-site equipment after ensuring that tyre fitter/mechanic has demonstrated proficiency in the safe use of the equipment</p> <p>Mechanic/tyre fitter views the maintenance and inspection records of the equipment before use</p>	<p>At the time of contracting the work the employer of tyre fitter/mechanic discusses the use of on-site equipment with the host employer. Both employers take responsibility for the safety of the tyre fitter/mechanic and develop safe systems of work that will apply. These systems ensure that</p> <ul style="list-style-type: none"> <li>• equipment tested and tagged</li> <li>• mechanic/tyre fitter views the maintenance and inspection records of the equipment before use</li> <li>• mechanic/tyre fitter has been trained and is competent in the safe use of the equipment</li> <li>• the mechanic/tyre fitter is properly supervised when using the equipment.</li> </ul>
<p><b>Communication with isolated workers</b></p>	<p>No monitoring of isolated worker</p>	<p>Off-site security to check on mechanic/tyre fitter on regular basis</p> <p>Paging or other service provided so job start and job finish can be communicated</p> <p>Procedures in place so the mechanic/tyre fitter can notify the supervisor if the job is not finished within the expected time</p>	<p>Mechanic/tyre fitter is in two-way communication with supervisor or other person</p> <p>Panic/emergency alarm available.</p>





# ROADSIDE MAINTENANCE ACTIVITIES



Low risk example. Prominent warning signs for approaching drivers.



Low risk example. High visibility vests and warning lights.

**Hazards include:** high speed traffic, poor visibility and weather conditions, loose, soft or sloping ground conditions. Employees may be struck by a passing vehicle or crushed by the vehicle moving off jacks. These control measures are applicable to all vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Traffic control at the disabled vehicle</b>	<p>Service person has not been trained or instructed in traffic control procedures at the scene of a breakdown</p> <p>Vehicle repairs are undertaken on the road</p> <p>Service person proceeds with repair activities immediately upon arrival and traffic control measures are not appropriate for the situation, eg</p> <ul style="list-style-type: none"> <li>only the service vehicle's flashing lights are used</li> <li>no warning signs displayed to warn motorists approaching breakdown scene</li> <li>approaching traffic is not controlled so as to provide a safe work area</li> </ul>	<p>Service personnel have received basic training and instruction in traffic control at the scene of a breakdown</p> <p>Vehicle removed to side of road before repairs are conducted</p> <p>Limited signage, eg high visibility cones/triangles displayed in immediate vicinity of disabled vehicle</p>	<p>Service personnel have been comprehensively trained (and regularly re-trained) in traffic control procedures and are proficient in assessing risks and controlling traffic at the scene of a breakdown</p> <p>On arrival the service person conducts on site risk assessment and implements traffic control measures to minimise risks to, and from oncoming traffic. Control measures may include</p> <ul style="list-style-type: none"> <li>calling the Police or appropriate authority, eg Citylink to provide traffic control if the area cannot be made safe</li> <li>having the vehicle towed to safe work area before repairs attempted</li> <li>prominent warning signs and lights for approaching drivers are displayed from the disabled vehicle to a distance in metres of 2 times the posted speed limit</li> <li>traffic lane closed to protect disabled vehicle and maintenance activity from approaching vehicles</li> <li>traffic controller with appropriate equipment used to warn approaching traffic of dangers.</li> </ul> <p><i>Note Additional guidance for traffic control measures may be found in the VicRoads Code of Practice for work on and beside roadways.</i></p>



# ROADSIDE MAINTENANCE ACTIVITIES

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Work area, lighting and visibility</b>	<p>Poor visibility and lighting available at breakdown site</p> <p>Service personnel wearing dark coloured clothing</p> <p>Service vehicle is not a conspicuous colour and does not carry adequate signage so as to be clearly visible and warn approaching motorists of maintenance activity</p>	<p>Natural lighting is only illumination means available</p> <p>High visibility vests are worn by service personnel</p> <p>Warning lights or signs on service vehicle signifying maintenance activity in progress</p> <p>Service vehicle painted in high visibility colour</p>	<p>Worksite area and vehicle adequately lit using auxiliary lighting systems if required.</p> <p>High visibility vests appropriate to day/night use worn by all persons at work site.</p> <p>A combination of warning lights and signs prominently displayed on service vehicle warning motorists of activity occurring, eg flashing or rotating warning lights, directional arrows.</p> <p>Service vehicle painted in high visibility colour and has retroreflective markings.</p>
<b>Availability of lifting aids to lift/manage heavy objects</b>	<p>Lifting equipment suitable for the task is not supplied by employer and is not available at the breakdown scene. Service person manually handles heavy objects, eg truck wheels, brake drums, etc</p>		<p>Service person is equipped with a range of manual handling aids appropriate to the tasks to be undertaken, eg wheel dolly, brake drum lifter.</p>
<b>Vehicle payload stability</b>	<p>Tyre changing or wheel/brake servicing work is carried out when the payload is unstable</p> <p>Vehicle is raised to a height that endangers vehicle stability</p>	<p>Payload is stable before tyres are changed or wheel/brake servicing is carried out, eg</p> <ul style="list-style-type: none"> <li>liquid in tanks stopped moving</li> <li>cattle in livestock carrier settled</li> </ul> <p>Vehicle is raised to the minimum height to allow for tyre/wheel removal</p>	<p>Vehicle is unloaded or load is reduced to a safe level prior to the commencement of tyre changing or wheel/brake servicing work.</p>
<b>Communication with roadside assistance isolated workers</b>	<p>There is no monitoring of the service person's health, safety and welfare while away from the workshop</p> <p>The service person has no means of emergency communication with the workshop or emergency services</p>	<p>Paging or other service provided so job start and job finish can be communicated</p> <p>Procedures in place so the mechanic/tyre fitter can notify the supervisor if the job is not finished within the expected time</p>	<p>Service person is in two-way communication with supervisor or other person.</p> <p>Panic/emergency alarm is also available.</p>



# LIFTING EQUIPMENT



Low risk example. Operating instructions prominently displayed.



Low risk example. Trolley jack and axle stands used at all times.

**Hazards include:** failure of lifting equipment causing crushing injuries and/or fatalities.

These control measures are applicable to all lifting equipment and vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Vehicle hoists</b>	<ul style="list-style-type: none"> <li>No hoist inspection, maintenance regime in place</li> <li>No operating or maintenance instructions located on hoist</li> <li>No Safe Working Load displayed on hoist</li> <li>The moving part of the hoist or its load is located closer than 600mm to any fixed structure or other equipment that moves so that a person could be trapped</li> <li>Electrical wiring or equipment damaged</li> <li>Hoist-operator controls damaged, poorly positioned or not clearly marked for safe operation</li> <li>No dropper bar (safety prop) fitted to in-ground hydraulic ram type hoist</li> <li>No training provided on safe use of hoists</li> </ul>	<ul style="list-style-type: none"> <li>Hoist inspections done in an ad hoc manner</li> <li>Inspection results not recorded</li> <li>Operating and maintenance instruction plates are prominently displayed on hoist</li> <li>Safe Working Load prominently displayed on equipment</li> </ul>	<ul style="list-style-type: none"> <li>Hoist inspections undertaken to manufacturer's specifications and with reference to Australian Standard AS/NZS 2550.9</li> <li>Pre-operation inspections done daily</li> <li>Routine inspection and maintenance done at least every 3 months</li> <li>Comprehensive annual inspections conducted</li> <li>Results of all inspections, servicing and maintenance are recorded in a log book and available to users and maintenance or inspection personnel</li> <li>All servicing and maintenance carried out by a suitably qualified and competent person.</li> <li>Operating and maintenance instruction plates are prominently displayed on hoist</li> <li>Safe Working Load prominently displayed on equipment</li> </ul>



# LIFTING EQUIPMENT

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Vehicle hoists, continued</b></p>			<p>The moving parts of the hoist or its load have a minimum 600mm clearance to any fixed structure or other equipment that moves.</p> <p>Electrical hoists and wiring are tested as per AS/NZS 3000 Australian Wiring Rules.</p> <p>Hoist controls in good condition, properly positioned and clearly marked for safe operation.</p> <p>Dropper bar (safety prop) fitted to in-ground hydraulic ram type hoist which prevents hoist lowering to less than 760mm.</p> <p>All hoist-safety devices operational.</p> <p>All hoist operators are trained in the correct use and inspection of the vehicle hoist</p>
<p><b>Hydraulic jacks and trolley jacks</b></p>	<p>No hydraulic jack and trolley jack inspection regime in place</p> <p>No operating or maintenance instructions located on trolley jack</p> <p>No vehicle stands used when vehicle raised by hydraulic jack or trolley jack.</p>	<p>Hydraulic jack and trolley jack inspections done in an ad hoc manner</p> <p>Inspections conducted but results not recorded</p> <p>Vehicle stands only used when employee under vehicle raised by hydraulic jack or trolley jack</p>	<p>Hydraulic jack and trolley jack inspections undertaken using Australian Standard AS/NZS 2615 as a guide, eg</p> <ul style="list-style-type: none"> <li>• pre-operation inspections done daily</li> <li>• routine inspection and maintenance done at least every 3 months</li> <li>• annual inspections conducted.</li> </ul> <p>Results of all inspections, servicing and maintenance are recorded in a log book and available to users and maintenance staff.</p> <p>All servicing and maintenance carried out by a suitably qualified and competent person.</p> <p>Operating and maintenance instruction plates available and prominently displayed on jack.</p> <p>Safe Working Load prominently displayed on equipment.</p> <p>Vehicle stands used at all times when vehicle raised by hydraulic-trolley jack.</p>

# LIFTING EQUIPMENT

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Vehicle ramps and stands</b></p>	<p>Vehicle ramps and stands have no rated capacity marked and the Safe Working Load is unknown</p> <p>Vehicles on ramps not secured in such a way as to prevent movement</p>		<p>Vehicle ramps and stands marked with rated capacity (Safe Working Load)</p> <p>Vehicle ramp and stands inspections undertaken</p> <p>Pre-operation inspections done daily</p> <p>Routine inspection and maintenance done at least every 3 months</p> <p>Annual inspections conducted</p> <p>Results of all inspections, servicing and maintenance are recorded in a log book and available</p> <p>Vehicles on ramps secured in such a way as to prevent movement (use of handbrake, wheel chocks, etc)</p>
<p><b>Tag out/lock out system</b></p>	<p>No Tag Out/Lock Out system in place when equipment identified as unsafe</p>		<p>All hoists, trolley jacks, stands and ramps that are found to be unsafe are immediately removed from service</p> <p>Tag Out/Lock Out system in place which ensures equipment not used until made safe</p>



# STORAGE AND RACKING OF PARTS



Low risk example. Storage system kept below shoulder height.

**Hazards include:** High force and awkward postures from lifting, lowering, and handling tyre/wheel assemblies. Falls from heights (eg ladders and mezzanine floors). Falls on level surfaces with tripping hazards.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Forklifts and lifting equipment</b>	<p>No traffic management plan in place for forklift work</p> <p>Tyres/parts loaded and unloaded by person standing on fork-arms of forklift</p> <p>No mechanical lifting devices to lift tyres/parts up to and down from mezzanine storage areas and racking above shoulder height</p> <p>Tyres/parts either thrown onto mezzanine storage or carried up stairs</p> <p>Order-picked tyres dropped from storage or racking</p>	<p>Mechanical aid to lift tyres to mezzanine storage area, but no mechanical aids to lift tyres/parts in and out of racking above shoulder height</p>	<p>Forklift operated on-site with strict traffic management as per WorkSafe guidelines.</p> <p>Tyres/parts stored in stillages that can be stacked with forklift.</p> <p>Mechanical aid used to lift tyres/parts up to racking above shoulder height or to mezzanine storage.</p>
<b>Storage systems</b>	<p>Larger tyres/parts or frequently fitted tyres and parts stored on levels above shoulder height</p> <p>Lack of stock control leads to excess tyres/parts – crowding storage area</p> <p>Pyramid stacking where stack is unstable, unbalanced or stacked too high to safely place or remove tyres/parts</p>	<p>Multi level racking with lighter tyres/parts stored on levels above shoulder height</p> <p>Frequently fitted tyres/parts are stored at low levels</p> <p>Risk assessment of layered stacking, ie pyramid stacking, has been done</p> <p>Factors in the risk assessment include tyre rigidity, tyre type and minimising double handling</p>	<p>No tyre/parts storage racking above shoulder height.</p> <p>Minimum stock on-site, based on usage rate.</p> <p>Limits on pyramid stacking are strictly followed.</p>

# STORAGE AND RACKING OF PARTS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Working at heights</b></p>	<p>Workers climb racking to retrieve tyres/parts</p> <p>Unsecured ladders used to reach items above shoulder height</p> <p>Work-on-ladders work method does not ensure that 3 points of contact with the ladder is maintained at all times</p> <p>Mezzanine floor storage with no guard rail, access by temporary steps or ladder</p>	<p>Straight ladders are secured top and bottom</p> <p>Working from 2nd-top or top step prohibited</p> <p>Work-on-ladders work method ensures 3 points of contact with the ladder at all times</p>	<p>Mobile access platforms are used to access stock above shoulder height</p> <p>Appropriate A frame platform ladder in use</p> <p>Mezzanine floor storage with guard rail and purpose-built stair access with hand rail</p>
<p><b>Lifting and moving of larger tyres, parts and wheels</b></p>	<p>One person changing tyre and wheel when risk assessment shows that two or more people are required</p> <p>Truck tyres or wheels lifted by hand</p>	<p>Size and type of tyre and wheel determined on job and work not started until appropriate traffic management, number of people required and appropriate equipment in place</p> <p>Truck tyres and wheels are rolled not lifted</p>	<p>Size and type of tyre and wheel is determined before the job is allocated, and so the appropriate number of people and mechanical aids assigned to job</p> <p>Mechanical equipment used to move or stack truck tyres and wheels</p>



# AWKWARD POSTURES



High risk examples. Awkward postures held for too long without a break.

**Hazards include:** awkward or sustained postures which result in injury to employees.

Carrying out work at the limit of reach or in awkward postures away from the body's centre of gravity requires muscles to work harder just to hold the posture. Over time more effort is needed because the muscles become fatigued. Held too long in one position, the body can lock up and spinal injuries can occur when people straighten up.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Working under bonnet</b>	<p>Levering heavy tools or doing fine work while the wrists and arms are in awkward postures at the limit of reach</p> <p>The upper torso is bent forward with no external support on the torso, eg is not allowed to rest on the wing</p> <p>Awkward posture is sustained for a long time without respite</p>	<p>Reduce the body's muscle effort needed to hold the mechanic in position, eg by</p> <ol style="list-style-type: none"> <li>1 Raise the vehicle to approximately belt height, this removes the need to bend as far forward</li> <li>2 Use overhead-mounted body support harnesses for work over the engine bay to reduce the load on the employees back</li> <li>3 Allow the upper torso to rest on the vehicle, eg by providing pads. Some form of protection may be needed to prevent pain or panel damage to the wings</li> <li>4 Provide powered tools that reduce the time spent applying force while working at the limits of reach, eg air operated tools</li> <li>5 Support the tool as well as the mechanic, so muscle effort goes into using the tool, not holding the tool</li> <li>6 Use the same principle for parts, so the mechanic doesn't have to hold parts</li> <li>7 Remove the bonnet so that the working position is less awkward</li> <li>8 Provide a stable step for access into the engine bay of taller vehicles</li> <li>9 Use a hoist to allow work from underneath, if this improves the working position</li> </ol>	<p>Working positions adopted are between shoulder and knee.</p> <p>Work is carried out close to the body</p> <p>Forces required to carry out work are low, eg when levering, twisting and lifting.</p> <p>Postures are not held for long durations.</p> <p>Lifting appliances, eg jigs, slings and dollies are adaptable to the size and shape of the item being handled, eg engines, transmissions.</p> <p>Lifting appliances allow inching using mechanical power, eg for correct location of engine when realigning engine to the chassis.</p> <p>Vehicles are designed with maintenance access and mechanics manual handling needs in mind, to minimise the risk of injury.</p>



# AWKWARD POSTURES

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Working under bonnet, continued</b></p>		<p>Reduce the duration that awkward postures are sustained for, eg by</p> <ol style="list-style-type: none"> <li>1 Job rotation, ensuring that the rotation regime is to tasks that require different muscle groups to be used, so that fatigued muscle groups can be rested</li> <li>2 Reducing task length at the limits of reach, eg by using mirrors to reduce time exploring the engine, purpose-built jigs so tools don't have to be held for long periods</li> </ol> <p>Reduce weight being handled, eg by draining oil before lifting</p>	
<p><b>Working under vehicle</b></p>	<p>Vehicle at height which forces the employee to adopt awkward postures for sustained periods</p> <p>Levering heavy tools or doing fine work while the wrists and arms are above head height</p> <p>The upper body or head is bent backward with no external support</p> <p>Awkward posture is sustained for a long time without respite</p>	<p>Methods are used that reduce the body's muscle effort needed to hold the mechanic in position, but the working position is still not within the best working zone. Methods include:</p> <ol style="list-style-type: none"> <li>1 Raising the vehicle by differing height vehicle hoists, platforms for the employee to stand on, use of in-ground pits</li> <li>2 Improving the mechanic's access, eg by use of creepers</li> <li>3 Improving the support for a person, eg by a chair with head support, able to be safely tilted while working under a vehicle</li> <li>4 Changing the position of the vehicle, eg by safely tilting and holding it so that the angle of tilt improves access, eg by ramps, side support</li> <li>5 Provide powered tools that reduce the time spent applying force while working at the limits of reach, eg air operated tools</li> <li>6 Provide measurement devices so that over-exertion does not occur, eg torque wrenches to identify the amount of work needed</li> <li>7 Support the tools as well as the mechanic, so muscle effort goes into using the tool, not holding the tool</li> <li>8 Reduce the need to hold or support parts being removed from the vehicle, eg by the use of dollies, slings, etc</li> </ol> <p>Reduce the duration that awkward postures are sustained for, eg by</p> <ol style="list-style-type: none"> <li>1 Job rotation, ensuring that the rotation regime is to tasks that require different muscle groups to be used, so that fatigued muscle groups can be rested</li> <li>2 Reducing task length for above-shoulder work, eg removing entire units so the bulk of the work can be done at a bench before re-installing the unit</li> </ol>	<p>The working position is within the Best Working Zone between shoulder and knee and work is carried out close to the body</p> <p>This may be done by differing height vehicle hoists, platforms for the employee to stand on, use of in-ground pits, and safely changing and holding the position of the vehicle</p> <p>Forces required to carry out work are low, eg when levering, twisting and lifting</p> <p>Postures are not held for long durations</p> <p>Vehicles are designed with maintenance access and mechanics manual handling needs in mind, to minimise the risk of injury</p>



# AWKWARD POSTURES

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Awkward positions inside vehicle cabin</b></p>	<p>Employee required to work using awkward postures for long durations inside the vehicle</p> <p>Work for long periods where awkward postures are adopted in parts of the vehicle cabin that have restricted or constrained access, such as footwells, under dashboard, in boot underneath rear window</p>	<p>Methods are used that reduce the body's muscle effort needed to hold the mechanic in position and to do work in that position</p> <p>Such methods include</p> <ol style="list-style-type: none"> <li>1 Using a spacer or filler to fill the footwell if it improves the working position, eg bean bag or foam equivalent</li> <li>2 Using an elevated counter-weighted creeper to obtain recumbent access on one plane into the vehicle. This could be height-adjustable to give access over door sills into footwells, over the driveshaft tunnel, into boot spaces, etc</li> <li>3 Use of braces or other methods of supporting the load when undoing dashes</li> <li>4 Provide powered tools that reduce time spent applying force while working in constrained awkward postures, eg air operated tools</li> <li>5 Support the tools as well as the mechanic, so muscle effort goes into using the tool, not holding the tool, eg magnetic clamps, magnetic tools, lanyards</li> <li>6 Removing seats or other items to improve access</li> <li>7 Changing the position of the vehicle, eg by safely tilting and holding it so that the angle of tilt improves access, eg by ramps, side support. A safe sideways tilt of a car at the right height can improve access into the driver's footwell</li> <li>8 Raising the vehicle on a hoist so the mechanic can access under the dash while standing</li> </ol> <p>Reduce the duration that awkward postures are sustained for, eg by</p> <ol style="list-style-type: none"> <li>1 Job rotation, ensuring that the rotation regime is to tasks that require different muscle groups to be used, so that fatigued muscle groups can be rested</li> <li>2 Reducing task length for work in restricted areas, eg removing entire units so the bulk of the work can be done at a bench before re-installing the unit</li> </ol>	<p>The working position is within the Best Working Zone between shoulder and knee and work is carried out close to the body while seated or standing. This is occasionally achievable on some electrical, upholstery installation and steering work depending on dashboard requirements, the height of the vehicle, and the worker's position</p> <p>Forces required to carry out work are low, eg when levering, twisting and lifting.</p> <p>Postures are not held for long durations</p> <p>Vehicles are designed with maintenance access and mechanics manual handling needs in mind, to minimise the risk of injury.</p> <p>Use of vacuum lifter to hold and position windscreens.</p>

# HANDLING HEAVY PARTS



Low risk examples. Manual handling aids used to carry and lift heavy components.

**Hazards include:** High force and awkward postures while lifting, lowering, and handling heavy components, eg wheel assemblies, engines, gearboxes, etc.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Removing gearboxes, transmissions, rear axles, truck wheels and brake drums, etc</b></p>	<p>No handling aids are provided. Heavy parts are manually lifted, lowered and moved by the mechanic/tyre fitter</p>	<p>Manual handling aids are available for some tasks but provide limited flexibility to lift, lower and hold components during maintenance work</p> <p>Floor surfaces and clutter restrict access and makes the use of handling aids difficult</p>	<p>Manual handling aids that remove the need to lift, lower, carry or drag heavy components are available for all tasks undertaken</p> <p>The handling aids are designed to also hold the component in a comfortable working position while maintenance is carried out, eg wheel lifter and stand for truck wheels, hydraulic – transmission jack and stand</p> <p>Floor surfaces are clear and level allowing easy use of handling aids</p>
<p><b>Removing and working on engines</b></p>	<p>Engines are removed with a chain-block attached to a lifting frame or roof beam. No loading calculations have been made on the strength of the supporting structure</p> <p>Engines are manually handled after removal from the vehicle</p>	<p>Engines are placed into an engine stand for servicing. The engine stand requires considerable effort to rotate and lock the engine</p>	<p>Engines are removed with load rated lifting equipment, eg hydraulic crane, etc</p> <p>Engines are placed into an engine stand for servicing. The engine stand can be moved freely with minimum effort, is stable and allows for the engine to be rotated and locked with minimal effort</p>



# HANDLING ASBESTOS – MOTOR VEHICLE PRODUCTS

This Guidance Note is provided to help employers and employees in the automotive-repair industry avoid the risk of exposure to asbestos dust. The risk of exposure to significant amounts of dust containing asbestos fibres may exist while repairs to brakes, clutches and high-temperature gaskets on motor vehicles are undertaken.

## PROHIBITIONS ON ASBESTOS-CONTAINING PRODUCTS

Prohibitions on the supply, sale, storage, use, re-use, installation and transport of asbestos-containing products came into effect across Australia on 31 December 2003. Replacement brake pads, brake shoes and clutch plates that are to be fitted to vehicles in Victoria must be asbestos free.

Keeping or supplying asbestos containing brake or clutch components will be illegal. Asbestos-containing gaskets, such as cylinder head and exhaust-manifold gaskets, will be prohibited from 31 December 2004.

At the time these bans came into effect there would have been many vehicles in use that still had asbestos containing brake pads/shoes, gaskets or clutch plates. Therefore the potential for exposure to asbestos in motor vehicle repair shops will remain for some time until asbestos components have been progressively removed from these vehicles.

## HEALTH EFFECTS OF ASBESTOS EXPOSURE

The inhalation of asbestos fibres may result in asbestosis, cancer of the lung and mesothelioma. The onset of these diseases is extremely slow and health effects of inhalation may not become apparent for many years (typically 20 to 40 years). These diseases are generally incurable and life threatening.

The control of risk associated with exposure to asbestos fibres is vital and is also a legal duty of employers under the *Occupational Health and Safety Act 1985* and the *Occupational Health and Safety (Asbestos) Regulations 2003*.

## DEALING WITH ASBESTOS

There are two main aspects to dealing with asbestos in motor vehicle repairs

- **Identification** of asbestos-containing components
- **Controlling** the risk to health from asbestos exposure through
  - containment of dust during removal and handling, and
  - safe disposal of components, eg dust, rags, etc.

### Identification

Identification of asbestos-containing components in many vehicles may be made difficult, if not impossible, by the absence of any identifying marks, service records or suppliers' details. If you are unsure of the composition of the component then you should

- treat it as though it contains asbestos, and
- apply protective measures.

If you need to have a sample of material tested for asbestos, the person who undertakes the analysis must be approved by the National Association of Testing Authorities (NATA) and can issue endorsed reports under the authority of a NATA accredited laboratory.

*Note:* Attendees at a recent industry workshop recommended that an industry identification system be set up to clearly identify vehicles/components that are asbestos free.



# HANDLING ASBESTOS – MOTOR VEHICLE PRODUCTS

## Control

Asbestos-containing brake pads, brake shoes and clutch plates suffer wear during use, leaving a coating of asbestos fibres and dust on the component and surrounding parts. Asbestos-containing cylinder head and exhaust gaskets can become friable (powdery) with heat and readily release dust and fibres when disturbed. Dry brushing any of these components or even tapping them, for example, can release large quantities of asbestos fibres into the air.

Asbestos fibres can spread large distances and may remain airborne for many hours after the job is finished. In this way the fibres can spread to other areas posing a risk to office/supervisory staff as well as the mechanics working in the workshop. It is therefore imperative to prevent dust and fibres from spreading into the workshop air and into any person's breathing zone.

## PRACTICAL METHODS OF REDUCING THE SPREAD OF ASBESTOS FIBRES

If the following simple controls are applied carefully it generally should not be necessary to carry out air monitoring in the workshop while servicing vehicle brakes, clutches and cylinder head/exhaust gaskets.

### Using a High Efficiency Particulate Air (HEPA) filter industrial vacuum cleaner

This type of cleaner needs to be certified by the manufacturer as fit for asbestos work and can be used to clean all asbestos dust from the components and other parts in the immediate vicinity. It may be necessary to purchase or fabricate special hose nozzles to reach difficult areas to ensure components are effectively cleaned free of asbestos. Any remaining dust should be removed with a wet rag. A domestic or standard vacuum cleaner must not be used as asbestos fibres will pass right through the filters and be blown into the air.

### Using a fine water mist from a hand spray bottle

A fine spray of water on the dust will dampen it and prevent it being dispersed. The component and parts in the immediate vicinity can then be wiped down with a wet rag. The rag should be used only once, then placed in a plastic bag and then into an asbestos waste disposal bin. Any spillage onto the workshop floor must be wiped up and disposed of in the same way. It is important that only a gentle misting spray is used as a coarse spray will disperse the asbestos fibres into the air. A respirator certified by the manufacturer as suitable for asbestos dust, eg a P1 or P2 disposable respirator, should be worn during the above cleaning processes.

Compressed air, water hoses and aerosol cans must **not** be used to clean asbestos dust off components in the open workshop as these methods will disperse large numbers of fibres into the air.

### Dedicated asbestos-handling area

To minimise risks to other people, the area where asbestos components are cleaned and removed should be segregated and in a location where wind or cooling fans, etc will not disturb any dust. All employees must be provided with information and training on asbestos hazards, its presence and the safety procedures that must be followed.

## HOW TO APPLY THESE CONTROLS TO TYPICAL WORKSHOP JOBS

### 1. Brake assembly repairs – Vacuum method (preferred method)

- segregate the vehicle from surrounding work areas; try to have at least 3 metres separation and avoid windy locations and cooling fans, etc
- use (portable) signs to indicate that asbestos removal is going on
- wear a P1 or P2 disposable respirator
- use a HEPA filter vacuum cleaner to clean the wheel prior to undoing the wheel nuts
- remove the wheel and vacuum any remaining dust on the wheel
- vacuum all dust off the brake assembly
- use a wet rag to wipe down all parts and remove final traces of dust
- vacuum any additional dust that is exposed during disassembly



# HANDLING ASBESTOS – MOTOR VEHICLE PRODUCTS

- place the component and rags etc into a plastic bag, seal or tie it and then place it into a marked plastic lined disposal bin/skip (see **Disposal** section below)
- if the component is to be sent to a specialist remanufacturing workshop rather than dumped, then double sealed bags are a suitable method of containing dust during transport. The outer bag should be marked with the words '**Caution Asbestos - Do not open or damage bag. Do not inhale dust**'.

## 2. Brake assembly repairs - wet method

- segregate the vehicle from surrounding work areas, try to have at least 3 metres separation and avoid windy locations and cooling fans, etc
- use (portable) signs to indicate that asbestos removal is going on
- wear a P1 or P2 disposable respirator
- place a tray or tape plastic sheeting to the floor under the removal area to catch spillage and to make clean up easier
- use a saturated rag to wet down the wheel and wipe off dust prior to removing the wheel nuts
- remove the wheel and clean off any remaining dust with the wet rag
- use a saturated rag and gentle water mist to thoroughly damp down any dust on the brake assembly
- use a saturated rag to wipe off exposed dust and dust exposed during disassembly. Wipe up any spillage on the floor
- place the component and rags, etc, into a plastic bag, seal or tie it and then place it into a marked plastic lined disposal bin/skip (see **Disposal** section below)
- if the component is to be sent to a specialist re-manufacturing workshop rather than dumped, then double sealed bags are a suitable method of containing dust during transport. The outer bag should be marked with the words '**Caution Asbestos - Do not open or damage bag. Do not inhale dust**'.

## 3. Clutch repairs

- segregate the vehicle from surrounding work areas, try to have at least 3 metres separation and avoid windy locations and cooling fans, etc
- use (portable) signs to indicate that asbestos removal is going on
- wear a P1 or P2 disposable respirator
- on separation of the gearbox from the engine, vacuum/wet wipe inside the bell housing and around pressure plate
- on removal of pressure plate and clutch plate, vacuum/wet wipe flywheel, housing and components
- place used rags and removed components, etc, in a plastic bag and seal or tie it
- place this plastic bag into a marked plastic lined disposal bin/skip (see **Disposal** section below).

## 4. Cylinder head and exhaust gaskets

- segregate the vehicle from surrounding work areas, try to have at least 3 metres separation and avoid windy locations and cooling fans, etc
- use (portable) signs to indicate that asbestos removal is going on
- wear a P1 or P2 disposable respirator
- if the gasket is damaged during separation of the components wet it with water to control asbestos fibres
- keep the gasket wet and carefully remove it without using power tools
- wipe down the joint faces and immediate area with a wet rag
- place the gasket and rag, etc, into a plastic bag and seal or tie it
- place this plastic bag into a marked plastic lined disposal bin/skip (see **Disposal** section below).

# HANDLING ASBESTOS – MOTOR VEHICLE PRODUCTS

## 5. Brake shoe re-manufacturing

The process of removing asbestos containing linings from brake shoes and clutch parts has the potential to release large quantities of asbestos fibres. Because of this, the control measures have to be more stringent. All work involving power tools should be carried out within an enclosure that is fitted with an effective dust extraction and filtration system that will prevent the release of asbestos fibres. If components are to be hand worked

- carry out the work in a separate area away from other workers preferably in a purpose built enclosure
- thoroughly wet down the component to control dust/fibres
- wear a disposable respirator and disposable overalls
- use local extraction to minimise the spread of dust/fibres
- atmospheric monitoring must be carried out to determine asbestos fibre exposure levels and the suitability of protective equipment
- clean up after removal with a vacuum cleaner and wet rag
- place waste asbestos into a plastic bag and seal or tie it
- place this plastic bag into a marked disposal bag, tie or seal it and place the bag into the disposal bin or skip (see **Disposal** section below)
- used respirators and overalls should not be worn away from the work area and should be disposed of the same way as asbestos waste.

### Disposal

Individual components and wiping rags etc should be placed in plastic bags tying each bag separately prior to placing in the container. Typically, plastic disposal bags should be heavy duty (200 micron) clear plastic and marked with the label **Caution Asbestos - Do not open or damage bag.**

**Do not inhale dust.**

Asbestos waste awaiting disposal at the workshop must be stored in closed containers, eg 60 or 200 litre steel drums with removable lids, sealed skip, etc.

Asbestos waste must be transported and disposed of to Environment Protection Agency (EPA) requirements. Asbestos waste can only be disposed of at a site licensed by the EPA to accept it and it must never be disposed of in the general waste system. It is recommended that packaging, transporting and disposing of asbestos waste be left to specialists. Firms specialising in this area can be found under 'Asbestos Removal &/or Treatment' in the phone directory.

For further information on EPA transport requirements see *The Transport and Disposal of Waste Asbestos*, Bulletin No 364C, which is available from EPA Victoria.



# HANDLING ASBESTOS - MOTOR VEHICLE PRODUCTS

## Some do's and don'ts when dealing with asbestos

DO	DON'T
<b>Develop</b> and implement a comprehensive asbestos removal management plan for brake, clutch and gasket work. Ensure that everyone potentially exposed to asbestos understands and applies the action plan. Regularly review the effectiveness of the plan with employees.	Don't use a vacuum cleaner without a HEPA type filter as the tiny asbestos fibres will pass through the filters and be blown into the air where they can be breathed in.
<b>Train</b> employees in safe removal methods and the use of personal protective equipment. Supervise work to ensure these procedures are followed.	Don't use air lines to clear away dust as this will release large numbers of asbestos fibres into the breathing zones of employees.
<b>Assume</b> that a component contains asbestos if unsure of the composition of the brake linings, clutch-plate or gasket. If you need to have a sample of material tested for asbestos, contact NATA.	Don't hit a brake drum with a hammer as this may release asbestos fibres into the breathing zones of employees.
<b>Provide</b> a designated, segregated area for asbestos tasks to be undertaken.	Don't eat, drink or smoke in areas where asbestos fibres are present.
<b>Ensure</b> that wet rags are disposed of after a single use by sealing in a plastic bag and placing in the disposal bin/skip.	Don't take contaminated clothing home for laundry as this may expose your family to risk.
<b>Add</b> a wetting agent, such as detergent, to the water when wetting down components. The water must be sprayed in a fine, gentle mist such as from a hand spray bottle or garden sprayer.	
<b>Place</b> a tray or tape plastic sheeting to the floor under the removal area, when using the wet method of dust removal, to catch spillage and to make clean up easier.	
<b>Wash</b> hands and exposed skin thoroughly at the end of each job and do not take asbestos contaminated clothing or respirators, etc, outside of the removal area. Place disposable respirators and overalls in a plastic bag and dispose of in the waste asbestos disposal bin.	
<b>Place</b> contaminated overalls and protective clothing in a plastic disposal bag and have this laundered at a specialist laundry.	
<b>Obtain</b> the advice of a competent person when designing, installing or maintaining local-exhaust ventilation.	

# HANDLING ASBESTOS - MOTOR VEHICLE PRODUCTS

## LEGAL REQUIREMENTS

All employers have a general duty under the *Occupational Health and Safety Act 1985* (OHS Act) to provide and maintain so far as is practicable a working environment that is safe and without risks to health.

## FURTHER INFORMATION

### Acts & Regulations

Occupational Health and Safety Act 1985

Occupational Health and Safety (Asbestos) Regulations 2003

Acts and regulations are available from Information Victoria on 1300 366 356 or order online at [www.bookshop.vic.gov.au](http://www.bookshop.vic.gov.au)

If you only want to view the legislation you can use the Parliament of Victoria web site – go to [www.dms.dpc.vic.gov.au](http://www.dms.dpc.vic.gov.au), click on 'Victorian Law Today' and scroll down to the 'Search' window.

### WorkSafe Victoria

Useful health and safety information is available on WorkSafe Victoria's web site; go to [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au) and click on the WorkSafe Victoria logo. Or contact our Advisory Service on 9641 1444 or toll free 1800 136 089.

### National Association of Testing Authorities

The National Association of Testing Authorities (NATA) can be contacted on 9329 1633 or visit their web site at [www.nata.asn.au](http://www.nata.asn.au)



# FITTING TYRES AND WHEELS



Low risk example. Vehicle on hoist with wheel at waist height.

## REMOVING THE WHEEL FROM THE VEHICLE AND REFITTING IT

**Hazards include:** High force and awkward postures during manual handling tasks, exposure to noise, compressed air, tyre/wheel explosion due to defective rims or split rims, vehicle falling, nearby traffic, nuisance dusts, asbestos (from brake linings). (Note: Compressed air must not be used to disperse dusts.)

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Lifting vehicles</b>	<p>Methods are used to lift vehicles that do not use purpose-built equipment, or the equipment used is of insufficient capacity, design, or construction</p> <p>Raising a vehicle using a jack without chocking two of the wheels in contact with the ground</p>	<p>Specialised lifting equipment used but load capacity cannot be read</p> <p>Raising a vehicle using a jack with two of the wheels in contact with the ground being chocked</p>	<p>Methods are used to lift vehicles that use purpose-built equipment of sufficient capacity, design, and construction.</p>
<b>Removing wheel nuts</b>	<p>Hand-operated equipment not suited to the task is used to loosen and remove wheel nuts, eg</p> <ul style="list-style-type: none"> <li>• short spanner or shifting spanner is used</li> </ul>	<p>Hand-operated equipment suitable for the task is used to loosen and remove wheel nuts without excessive effort, eg</p> <ul style="list-style-type: none"> <li>• a long spanner or cross brace is used with appropriate posture</li> </ul> <p>When working on trucks, trailers, earth moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>• a Golden Tool (ie a purpose-built tyre fitting hand lever) is used with appropriate posture</li> <li>• the type of tyre/wheel is inspected and specific fitting procedure is considered before starting work, eg work on split rims</li> </ul>	<p>Powered equipment suitable for the task is used to loosen and remove wheel nuts without excessive effort, eg</p> <ul style="list-style-type: none"> <li>• impact wrench.</li> </ul> <p>When working on trucks, trailers, earth moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>• large wheel nuts are lubricated to aid removal.</li> </ul>

# FITTING TYRES AND WHEELS

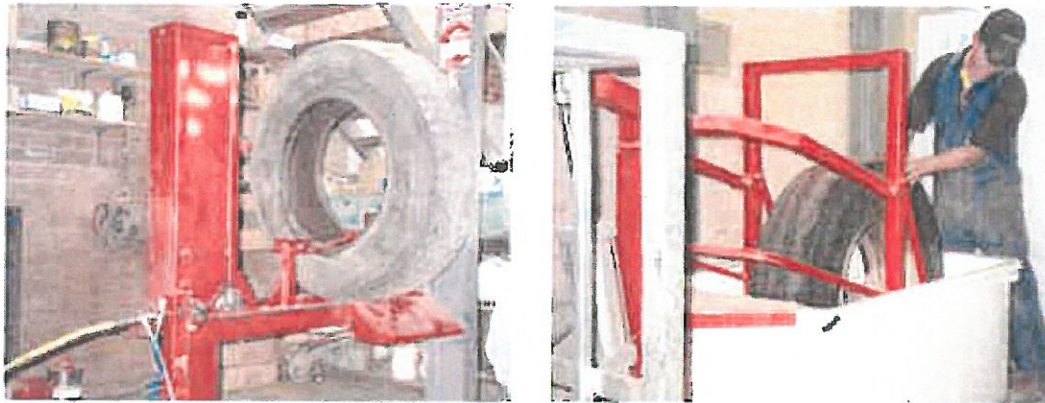
ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Lifting and moving tyres and wheels</b></p>	<p>Work methods are used that require awkward postures or use of excessive force when handling wheels</p> <p>Tyre/wheels carried over long distances</p> <p>Rolling more than two tyre/wheels at once</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>one-person lifting of tyre/wheels</li> <li>rolling heavy, tall, unstable tyre/wheels</li> </ul> <p>Handling of tyres and wheels out of and into off-site service vehicle that relies solely on manual techniques, including pivot</p>	<p>Training in manual handling techniques is provided when it is not practicable to raise the vehicle to waist height when removing or replacing wheels on vehicles</p> <p>Tyre/wheels are rolled, not carried, over distances</p> <p>Rolling no more than two tyre/wheels at once</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>to reduce the risk of applying sudden high force, tyres/wheels are prevented from falling during movement</li> <li>training is provided in manual-handling techniques and the use of mechanical aids</li> <li>rolling short, wide (stable) tyre/wheels</li> </ul> <p>Handling of tyres and wheels out of and into off-site service vehicle relies on manual techniques, but ramps, tail-gate loaders or other mechanical aids are provided for roll-on/roll-off</p>	<p>Wheel-carrying trolley, under-slide or other mechanical device is used to eliminate heavy lifting and moving of wheels</p> <p>If the vehicle is on a hoist with its wheels at waist height, wheels can be lifted and carried short distances</p> <p>If vehicle on low hoist or on vehicle support stands, wheels can be removed and lowered to the ground and rolled short distances</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>mechanical aids such as crane and sling, forklift with attachment, tyre/wheel-carrying trolley, under-slide or other mechanical devices are used to eliminate heavy lifting and moving of tyres</li> <li>training is provided in appropriate manual-handling techniques and the use of mechanical aids</li> </ul> <p>Handling of tyres and wheels out of and into off-site service vehicle assisted by mechanical devices</p> <p>Service vehicle is not congested with tyres, so that over-exertion to obtain tyres is not required</p>



# FITTING TYRES AND WHEELS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Refitting wheel on vehicle</b></p>	<p>Wheel nuts are not tightened in the correct even sequence</p> <p>Over-torquing creates a sprain or strains hazard for the next person removing the wheel</p> <p>Studs or wheel nuts are damaged by the tightening method (bent, distorted thread stripped)</p> <p>There is no final torque check of wheel nuts</p> <p>Wheel lifted onto hub by hand without use of lifting equipment or tools</p> <p>Jack or axle stands are too high so that the vehicle is unstable when force is applied</p> <p>Chocks are not in place when lowering vehicle using a jack</p>	<p>Tyre fitters are trained to hand tighten and torque wheel nuts in the correct sequence</p> <p>Tighten wheel nuts using impact wrench set to correct tension without final re-torque</p> <p>Re-torque of wheel nuts by hand</p> <p>With chocks firmly in place, jack is used to get hub to the right height to enable wheel to be slid on without lifting or over-exertion</p>	<p>Wheel is placed firmly on mounting and balanced on mounting before nuts are done up evenly and firmly</p> <p>Tighten wheel nuts in correct sequence using a suitable tool set to the correct tension, eg torque spanner. Lower vehicle slowly and re-tension wheel nuts.</p> <p>Chocks are in place when lowering vehicle using a jack.</p> <p>Runout is checked.</p> <p>Torque method ensures wheel nuts and studs are not distorted, damaged or over-tightened.</p>

# FITTING TYRES AND WHEELS



Low risk example. Bead breaker and mechanical aid used with leak detection bath.

## DEFLATING THE TYRE, REMOVING IT FROM THE RIM AND REPLACING IT

**Hazards include:** high force and awkward postures during manual-handling tasks. Explosions due to valve blockages when deflating resulting in high velocity fragments of tyre/wheel. Higher risks are known to exist with: retreads, used tyres, aged wheels (rims) and substandard lock rings. With any inflated tyre, there is a risk of an explosion.

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Deflation to minimise explosion hazard</b>	<p>Deflation is not monitored</p> <p>Work methods allow for tyre fitters to apply heat to an inflated tyre or to rim components</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>water not fully removed from water-filled tyre before working on the tyre</li> <li>doubtful tyres are not deflated before being worked on</li> <li>deflation is not monitored for frosting and assessing blockages</li> <li>rims are not inspected before work</li> <li>people within trajectory zone during deflation</li> </ul>	<p>Deflation is monitored but removal work started before fully deflated</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>tyre is fully deflated before removal from vehicle if inspection shows the rim has fatigue, rust, or other faults (Note Tyres may remain partially pressurised if the wheel is to be rolled)</li> </ul>	<p>Tyre is fully deflated before starting to remove from rim</p> <p>Drill is used to deflate tyres in cases of doubt, eg where fillers are in tyre</p> <p>Deflation is done in a way that the valve does not freeze or block up.</p> <p>Eye protection is used when deflating tyres</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>tyre is fully deflated before removal from vehicle</li> <li>a drill is used to deflate tyres in cases of doubt, eg where fillers are in tyre</li> <li>both tyres are deflated for dual-tyre hubs</li> <li>eye protection used when deflating tyres</li> <li>loosening of the rim set of split rim assemblies does not commence until the tyre is completely deflated</li> </ul>



# FITTING TYRES AND WHEELS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Breaking the bead</b></p>	<p>Bead is broken by driving over tyre/wheel, by jumping on the tyre, or by hammering it, eg with slide hammer</p>	<p>Manual methods are used to break the bead, eg lever, bead breaker and mallet, or slide hammer, tyre bar or golden tool</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>• for the back bead, the work method includes using the weight of the tyre to assist</li> <li>• pneumatic or other mechanised methods are used to break the bead</li> </ul>	<p>Tyre removal and fitting machine (tyre changer) is used for tubeless and tubed tyres so that the bead is not broken by hand.</p>
<p><b>Lifting and moving tyres &amp; wheels</b></p>	<p>Repeated tyre/wheel changing without using tyre changer</p> <p>Tyre changer is used but it is in substandard or not serviceable condition</p> <p>Work methods are used that require awkward postures or use of excessive force when changing tyres</p>	<p>Tyre/wheel is lifted onto tyre removal and fitting machine tyre changer and balancer using suitable manual-handling techniques</p> <p>Training in manual-handling techniques is provided. This training includes the use of mechanical aids, such as levers and jacks, and lifting techniques when it is not practicable to remove tyre from rim using tyre changer</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>• tools provided are serviceable and levers are long enough to minimise the amount of exertion required</li> <li>• lifting devices or other suitable mechanical aid is used to remove and replace tyre on hub and to remove or replace tyre from rim</li> </ul>	<p>Tyre changer is at a working height that minimises bending, lifting, over-extension and awkward postures.</p> <p>Mechanical aids are used to reduce the risk of injury, eg</p> <ul style="list-style-type: none"> <li>• to re-position the tyre/wheel from the changing machine to the balancer</li> <li>• to put tyre/wheel into and out of the leak detection bath.</li> </ul> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>• lifting equipment is used to raise and lower the spare wheel from its location.</li> </ul>

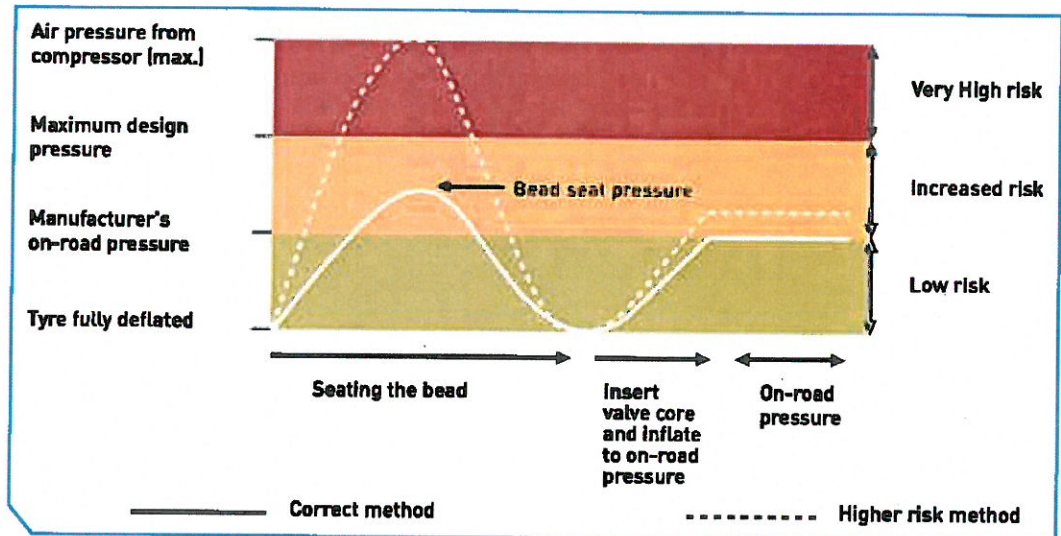
# FITTING TYRES AND WHEELS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Preparing tyre for refitting</b></p>	<p>Repairs are done to tyres/wheels that are outside the limits set in AS 1973</p> <p>Radial &amp; bias-ply tyres are mixed on the vehicle</p> <p>Tyres treated with liquid-puncture sealant and showing penetration damage through the inner liner are worked on</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>work method for changing steer tyres requires the tyre fitter to work inside the wheel well without a tag-out/lock-out procedure in place that controls the risk of inadvertent start-up or crush from steering movement</li> </ul>	<p>Risk assessment considers the tyre/wheel size, rim size, and all parts (components)</p> <p>Type of tyre/wheel is inspected and specific fitting procedure is considered before starting work, eg work on split rims</p>	<p>Tyres/wheels to be repaired conform to AS 1973.</p> <p>Job planning includes</p> <ul style="list-style-type: none"> <li>consideration of the consequences of metric versus imperial sizing (including rounding up or rounding down when converting from one to the other)</li> <li>checking rim dimensions accurately</li> <li>considering the direction of the tyre's rotation when fitting directional tyres to a vehicle</li> </ul>
<p><b>Refitting tyres</b></p>	<p>Minimal inspection of tyre</p> <p>Lubricants are not used</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>tractor tyres are not inspected for bead hang-up on the bead seat before inflating</li> </ul>	<p>Valve is visually inspected for damage and wear</p> <p>Lubricants are used but are not vegetable-based</p>	<p>Rusty parts are brushed, cleaned or replaced</p> <p>New valve inserted into the tyre</p> <p>Lubricants suitable for the task are used (normally vegetable-based)</p>



# FITTING TYRES AND WHEELS

## TWO METHODS FOR INFLATING A TYRE



## INFLATING TYRES

**Hazards include:** tyre explosion as a result of zipper failure, bead seat and lock-ring failure, split-rim failure, or other rim failures. Higher risks are known to exist with retreads, second-hand tyres, aged wheels (rims) and substandard lock-rings.

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Tyre restraint</b>	No tyre restraint device used	Tyres are inflated within an open restraint device such as chains, straps, or locking bars, or under a vehicle tailgate The restraint equipment is not anchored or prevented from movement, eg a tailgate without hydraulics	Purpose designed tyre restraint used. When working on trucks, trailers, earth-moving equipment or farm vehicles <ul style="list-style-type: none"> <li>tyre/wheels are inflated within a fully-enclosed restraint device such as a safety cage or purpose-built bag</li> <li>restraint device for very large tyre/wheels may include using a barrier such as a wall or an appropriately-sized vehicle</li> <li>the restraint device is securely anchored.</li> </ul>

# FITTING TYRES AND WHEELS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>Explosion hazard</b></p>	<p>No barriers or exclusion zones in place</p> <p>Work methods allow for tyre fitters to hit or strike a fully inflated tyre</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>no work methods to address the risks associated with 3-piece and 5-piece rims</li> </ul>	<p>Vehicle or other such temporary barrier used to protect other people from tyre explosion</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>valve is visually inspected for damage and wear</li> <li>people are excluded from the trajectory zone by methods that do not include physical barriers</li> </ul>	<p>Purpose-built guards are used or exclusion zones set up for tyre inflating to protect tyre fitter and other people at the work site</p> <p>When working on trucks, trailers, earth-moving equipment or farm vehicles</p> <ul style="list-style-type: none"> <li>risk assessment of 3-piece and 5-piece rims has resulted in development of safe-operating procedures for these rim types</li> <li>Risk controls are in place for these rim types</li> <li>people are excluded from the trajectory zone by physical barriers.</li> </ul>
<p><b>Monitoring air pressure</b></p>	<p>Plant and equipment does not comply with AS 1268</p> <p>The air pressure source is unregulated</p> <p>Tyre is inflated over the manufacturer's maximum design pressure</p>	<p>Plant and equipment complies with the shall (mandatory) requirements of AS 1268</p> <p>In-line air gauge without automatic cut off is used</p>	<p>Plant and equipment complies with all requirements of AS 1268</p> <p>Tyre is inflated with an in-line air gauge that has an automatic cut-off set below the tyre manufacturer's design pressure</p> <p>An air regulator is used</p> <p>The pressure (air gauge) is monitored continuously</p>
<p><b>Bead seating</b></p> <p>(Refer graph on previous page for preferred inflating method)</p>	<p>To seat the bead, the tyre is inflated to above the manufacturer's maximum recommended pressure</p> <p>Bead seating is checked above the manufacturer's maximum design pressure</p> <p>Tyre bead is broken (snaps) across the tyre</p>	<p>Bead seating is checked prior to removing tyre/wheel from the restraint device</p> <p>Bead seating is not checked until reaching pressures above the manufacturer's on-road pressure</p> <p>If a bead is not correctly seated, tyre is fully deflated, lubricated, inspected and tyre inflation restarted</p>	<p>Bead seating is checked prior to removing tyre from the restraint device.</p> <p>Bead seating is checked at the pressure that is 2/3rds or less the manufacturer's on-road pressure.</p> <p>If the beads of the tyre are not seated, tyre is fully deflated, lubricated, inspected and tyre inflation restarted</p> <p>When working on tractors</p> <ul style="list-style-type: none"> <li>tractor tyre bead seating is checked at 100 kPa maximum.</li> </ul>



# FITTING TYRES AND WHEELS

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<p><b>On-road tyre pressure</b></p>	<p>Final on-road tyre pressure exceeds the tyre manufacturer's maximum operating pressure</p>	<p>Final on-road tyre pressure is not the same as the on-road (correct) pressure as set out by the manufacturer, or if they do not supply the information, by the Tyre and Rim Association Manual</p>	<p>Tyre is inflated to the correct (on-road) run pressure as set out by the manufacturer, or if they do not supply the information, by the Tyre and Rim Association Manual</p> <p>When working on tractors</p> <ul style="list-style-type: none"> <li>▪ Tractor tyres are not inflated beyond 200 kPa, unless the manufacturer instructs a higher pressure.</li> </ul>
<p><b>Wheel lock rings</b></p>	<p>Lock rings are not inspected</p> <p>Lock rings are used even if they are out of shape or the ends don't meet</p>		<p>Tyres that have distorted or damaged lock-rings are not inflated.</p>

# FITTING TYRES AND WHEELS

## BALANCING THE WHEEL

**Hazards include:** high force and awkward posture during manual-handling tasks. Flying objects and entrapment through incorrect use of the wheel-balancing machine (machine-guarding issues). Higher risks are known to exist with retreads, used tyres, aged wheels (rims) and substandard lock-rings. With any inflated tyre, there is a risk of an explosion, both on the wheel-balancing machine and on the vehicle.

These control measures are applicable to all vehicles. Additional controls are given for specific types of vehicles.

ISSUE/ACTIVITY	HIGH RISK	MEDIUM RISK	LOW RISK
<b>Using the wheel balancer</b>	<ul style="list-style-type: none"> <li>Wheel is not balanced before refitting</li> <li>Balancing rig is poorly maintained</li> <li>Balancing rig is not inspected for locking devices or wheel onto rig, or for distortion to shaft</li> <li>Wedges fitted incorrectly</li> </ul>	<ul style="list-style-type: none"> <li>Second-hand weights are used when balancing wheel</li> </ul>	<ul style="list-style-type: none"> <li>Wheel balancing is always done</li> <li>Wheel balancing is done using an enclosed (guarded) interlocked machine</li> <li>Wheel weights are appropriate for the rim</li> <li>When working on trucks, trailers, earth-moving equipment or farm vehicles                             <ul style="list-style-type: none"> <li>wedges fitted correctly and rim trued</li> </ul> </li> </ul>
<b>Lifting and moving wheels</b>	<ul style="list-style-type: none"> <li>Work methods are used that require awkward postures or use of excessive force</li> <li>Tyre/wheels carried over long distances</li> <li>Rolling more than two tyre/wheels at once</li> <li>Wheel transferred to vehicle from balancer by carrying</li> </ul>	<ul style="list-style-type: none"> <li>Training in appropriate lifting and manual-handling techniques is provided</li> <li>Wheels are rolled, not carried over distances</li> <li>Rolling no more than two tyre/wheels at once</li> <li>Leverage tool is used to get wheel at hub height</li> </ul>	<ul style="list-style-type: none"> <li>Wheel-carrying trolley, under-slide or other mechanical device may be used to eliminate heavy lifting and moving of tyre/wheels</li> </ul>



The checklist provided is to aid identification of key issues in most automotive workshops. Modify it as required for your premises. It targets many of the injury causes shown in the pie chart on page 3 and mentioned elsewhere in this document.

Company name:

Date of Inspection:

 /  / 

ITEM	YES	NO	COMMENTS
<b>Policies and Procedures</b>			
<i>OH&amp;S Policy displayed</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>OH&amp;S Committee in place</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>DWG's formed and HSR's elected</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Issue resolution procedures in place</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>New employees and contractors induction program in place</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Approved first-aid kit and eye-wash equipment available</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Injury register provided and maintained</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Emergency contact numbers prominently displayed</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Unauthorised persons prohibited from entering workshop areas</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Standard Operating Procedures (SOP's) for workshop activities</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>'If you are injured' poster displayed in workplace</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Manual Handling</b>			
<i>Information and Guidance Material on identifying and controlling manual handling risks is available from the WorkSafe Victoria website, VACC or your local WorkSafe office</i>			
<i>Manual-handling risks such as heavy and awkward items identified, assessed and controls implemented</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Awkward and sustained postures such as working under bonnets identified, and controls implemented</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Mechanical aids used to lift heavy or awkward items</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Toolboxes mobile for ease of moving around workshop area</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Workshop areas</b>			
<i>All exits clear and accessible</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Toilets and showers provided and clean</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Kitchen facilities provided and adequate</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Adequate lighting provided</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Fire extinguishers provided, maintained and accessible</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Hearing protection and audiometric testing provided and records kept as per Noise Regulations</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>All electrical equipment maintained as per AS/NZS 3000 and records kept</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>All hoists, trolley jacks serviced and maintained as per AS/NZS 2615 &amp; 2550 9 and records kept</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Minimum 600mm clearance provided between hoists and other equipment</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Compressors inspected and serviced regularly</i>	<input type="checkbox"/>	<input type="checkbox"/>	



## AUTOMOTIVE WORKSHOP INSPECTION CHECKLIST

ITEM	YES	NO	COMMENTS
<i>Power tools inspected and serviced regularly</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Parts stored in appropriate areas with racking, shelves, etc</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>No goods stored on top of internal offices/buildings unless designed for load bearing purposes</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Eye protection provided where needed</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Guards fitted to equipment where required, ie bench grinders, compressor pulleys, etc</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>All Asbestos Containing Materials (ACMs) handled appropriately as per WorkSafe Guidance Material, eg brakes, clutches, gaskets</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>No electrical equipment used in 'wet' areas of workshop</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Welding screens available and used</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Tyre inflation cages available and used</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>All lifting equipment inspected regularly, eg chains, slings</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Chemicals</b>			
<i>All dangerous goods/hazardous substances stored and labelled appropriately</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Material Safety Data Sheets available for all chemicals</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Dangerous goods/Hazardous substances register kept and maintained</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Appropriate personal protection equipment/training provided for employees when using dangerous goods/hazardous substances</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Waste oils and other products disposed of appropriately</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Falls from Heights</b>			
<i>Mezzanine levels provided with guard rails and kickboards if required</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Stairs have handrails and anti-slip tread</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Work platforms used to gain access to work at height</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Pit areas provided with fall protection</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Housekeeping</b>			
<i>Workshop floor free of slips and trips hazards</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Fluid spills cleaned up immediately</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Rubbish not stored near flammable substances</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Spill-containment equipment available</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>All tools and equipment stored appropriately</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Air lines, hoses, and tools clear of floor surfaces</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Gas cylinders stored and secured appropriately</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Metal rubbish bins provided and emptied on a regular basis</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Clothing laundered in an appropriate manner</i>	<input type="checkbox"/>	<input type="checkbox"/>	



## FURTHER INFORMATION

A range of sources can provide you with further information. These include:

### ACTS AND REGULATIONS

Occupational Health and Safety Act 1985  
Dangerous Goods Act 1985  
Occupational Health and Safety (Manual Handling) Regulations 1999  
Occupational Health and Safety (Plant) Regulations 1995  
Occupational Health and Safety (Certification of Plant Users and Operators) Regulations 1994  
Occupational Health and Safety (Issue Resolution) Regulations 1999  
Occupational Health and Safety (Incident Notification) Regulations 1997  
Occupational Health and Safety (Hazardous Substances) Regulations 1997  
Occupational Health and Safety (Asbestos) Regulations 2003  
Occupational Health and Safety (Prevention of Falls) Regulations 2003  
Dangerous Goods (Storage and Handling) Regulations 2000  
Occupational Health and Safety (Noise) Regulations 1992

Acts and regulations are available from Information Victoria on 1300 366 356 or order online at [www.bookshop.vic.gov.au](http://www.bookshop.vic.gov.au) If you only want to view the legislation you can use the Parliament of Victoria web site – go to [www.dms.dpc.vic.gov.au](http://www.dms.dpc.vic.gov.au), click on 'Victorian Law Today' and scroll down to the 'Search' window.

### CODES OF PRACTICE

Manual Handling (No. 25, 2000)  
Plant (No. 19, 1995)  
Noise  
First Aid in the Workplace (No. 18, 1995)  
Workplaces (No. 3, 1988)  
Hazardous Substances (No.24)(2000)  
Storage and handling of Dangerous Goods (No.27)(2000)

Copies of codes of practices can be obtained by contacting WorkSafe Victoria on 03 9641 1333, or your local WorkSafe Victoria office.

### GUIDANCE NOTES & ALERTS

Other useful health and safety information is listed below. These are available on WorkSafe Victoria's web site – go to [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au)

A Guide to Workplace Consultation  
Manual-Handling Risk Assessment – Worksheet  
Pallet Racking  
Forklift Safety  
Fall arrest and travel restraint systems  
A Guide to Risk Control Plans  
Back belts are not effective in reducing back injuries  
Casual workers – Managing their health and safety  
Confined Spaces – The dangers of Poorly Ventilated Spaces  
Consulting with Employees on Health and Safety  
Prevention of Bullying and Violence at Work

## FURTHER INFORMATION

### AUSTRALIAN STANDARDS

**AS 1418.1 – 1994** Cranes (including hoists and winches) - General requirements

**AS 1755 – 2000** Conveyors – Safety Requirements

**AS 4084 – 1993** Steel storage racking

**AS 1657 – 1992** Fixed platforms, walkways, stairways and ladders - Design, construction and installation

**AS 1891.4** Industrial fall-arrest systems and devices – selection use and maintenance

**AS 2550.1 – 1993** Cranes – Safe Use – General Requirements

**AS 2359.8 – 1995** Powered industrial trucks – Pallet stackers and high-lift platform trucks - Stability tests

**AS 2626** Industrial-safety belts and harnesses – selection use and maintenance

**AS 2615:1995** Hydraulic trolley jacks

**AS 1418.9:1996** Cranes (including hoists and winches) Part 9 Vehicle hoists

**AS 2550.9:1996** Cranes – Safe use. Part 9: Vehicle hoists

**AS 4457 – 1997** Earth-moving machinery; Off-highway rims and wheels – maintenance and repair

**AS 1973 – 1993** Pneumatic tyres – Passenger car, light truck, and truck/bus – Retreading and repair processes

**AS/NZS 1268 – 1996** Equipment for checking pressure and inflation of tyres

**AS 4024.1 – 1996** Safeguarding of Machinery; Part 1 General Principles

Australian Standards are available from Standards Australia on 1300 654 646, or on-line at [www.standards.com.au](http://www.standards.com.au)

### FINDING MECHANICAL LIFTING DEVICES

Mechanical lifting aids are available from retailers throughout Australia – look under 'Lifting Equipment' in the telephone directory.

### OTHER INFORMATION AND JURISDICTIONS

The Safer Driving Kit – As part of the Safer Driving initiative, a Safer Driving Kit has been developed by VicRoads in association with the **RACV, Transport Accident Commission (TAC) and RoadSafe**.

There is some guidance material available from South Australia's OHS agencies on hazards such as lifting gearboxes under vehicles – [www.workcover.com/ftp/documents/resInfoSheetMechanic.pdf](http://www.workcover.com/ftp/documents/resInfoSheetMechanic.pdf)

The Queensland DTIR website has motor workshop audit report although this is rather dated. It can be seen at <http://www.whs.qld.gov.au/blitzaudit/audit/audit03.pdf>

WorkCover South Australia has a range of motor workshop information at <http://www.workcover.com/safer/motor/motor.htm>

The British HSE site <http://www.hse.gov.uk/mvr/index.htm> has very good guidance for automotive workshops in general and on some specific workshop hazards.

Tyre and Rim Association Manual – 9818 0759.

*This guidance material has been prepared using the best information available to WorkSafe Victoria. Any information about legislative obligations or responsibilities included in this material is only applicable to the circumstances described in the material. You should always check the legislation referred to in this material and make your own judgement about what action you may need to take to ensure you have complied with the law. Accordingly the Victorian WorkCover Authority extends no warranties as to the suitability of the information for your specific circumstances.*





This page has been left blank intentionally



#### VICTORIAN WORKCOVER AUTHORITY

WorkSafe Victoria offers a complete range of health and safety services:

- Emergency response
- Advice, information and education
- Inspections and audits
- Licensing and certification
- Publications

#### WORKSAFE VICTORIA CONTACTS

Head Office

Victorian WorkCover Authority

24th Floor

222 Exhibition Street

Melbourne Victoria 3000

GPO Box 4306

Melbourne Victoria 3001

Phone ..... 9641 1555

Fax ..... 9641 1222

Toll-free ..... 1800 136 089

#### LOCAL OFFICES

Ballarat ..... 5338 4444

Bendigo ..... 5443 8866

Dandenong ..... 8792 9000

Geelong ..... 5226 1200

Melbourne:

1628 Bourke Street ..... 9941 0558

Mildura ..... 5021 4001

Mulgrave ..... 9565 9444

Preston ..... 9485 4555

Shepparton ..... 5831 8260

Traralgon ..... 5174 8900

Wangaratta ..... 5721 8588

Warrnambool ..... 5562 5600

#### PUBLICATIONS

Phone ..... 9641 1333

#### WEBSITE

[www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au)

#### EMAIL

[info@workcover.vic.gov.au](mailto:info@workcover.vic.gov.au)

#### VICTORIAN WORKCOVER ADVISORY SERVICE

24th Floor

222 Exhibition Street

Melbourne Victoria 3000

Phone ..... 9641 1444

Fax ..... 9641 1353

Toll-free ..... 1800 136 089

#### EMAIL

[advisory\\_service@workcover.vic.gov.au](mailto:advisory_service@workcover.vic.gov.au)