

Working safely under motor vehicles being repaired



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Introduction

This leaflet is aimed at owners, managers and supervisors of motor vehicle repair facilities – it may also be useful to employees.

Working beneath a vehicle is often required to check for faults, servicing, repairs etc. Because these tasks are so common, people may get used to the fact that they are working under potentially lethal weights. But, unfortunately, serious and fatal accidents do happen each year despite the dangers and precautions being well known.

The leaflet includes extracts from HSE inspectors' accident reports (mostly fatalities) involving people working beneath vehicles in motor vehicle repair. They don't cover every danger but include explanations of how you can minimise the most serious risks and will hopefully remind you of the consequences of getting it wrong.

Use the correct equipment

A worker was attempting to repair a car away from the workshop using a forklift truck and blocks of wood to raise it off the ground. It slipped off the forks and crushed him to death.

Key precautions

- Always use the right equipment for the job. Don't be tempted to take short cuts or use inappropriate items.

Make sure you use all the necessary equipment

A mechanic was replacing a gearbox with a car raised on a hydraulic trolley jack and two wheel-removal jacks. The car slipped from the supports, crushing and killing him.

A trainee HGV fitter, working with an experienced mechanic, was fatally crushed when an HGV slipped from a hydraulic jack. Axle stands were available but not used. An almost identical accident, again involving a trainee working with an experienced fitter, happened three years earlier at a different company.

Key precautions

- Never work beneath a vehicle that is only supported on jacks; use axle stands that are in good condition and inspected every year.

Use equipment correctly

Two men were using a chain block suspended from a gantry to remove an engine from a vehicle. As one turned his back on the raised load, the other moved the gantry, which fell onto his colleague's head, killing him. They were not following a safe system of work.

A technician was working on a large vacuum tanker/gulley cleaner, which was raised on jacks and axle stands. These appear to have suddenly given way, crushing him to death.

Key precautions

- Make sure there are safe working procedures in place when moving heavy loads, particularly when they are raised.
- Pins for axle stands need to be close-fitting and of the correct specification – screwdrivers, bolts etc are not acceptable.
- For most axle stands you should use no more than a single pair.
- Use stands on a hard, level surface, eg concrete.
- Securely chock wheels remaining on the ground.
- Make sure that each stand is securely located under a strong point on the vehicle; consult the vehicle manufacturer's handbook for guidance.
- Do not exceed the rated capacity of the stand.



Figure 1 Car with trolley jack and axle stand on a firm, level surface

Make sure lifting equipment is installed correctly

A two-post lift was installed into concrete of unknown strength. Three people were working under a raised vehicle and moved away minutes before the lift collapsed without warning. Thankfully, no one was injured.

Key precautions

- Make sure the floor and fixings meet the lift manufacturer's specification. If in doubt, get specialist advice.
- Once installed, the lift must be tested before use by a competent person, who should issue a certificate.
- Regularly check the fixing bolts with a torque wrench to ensure they remain tight.



Figure 2 A collapsed two-post lift

Maintain lifting equipment and train operators to use it correctly

A car fell off a two-post lift, killing the mechanic working below. The arms did not lock and the lifting pads were damaged or missing.

Key precautions

- Vehicle lifts need to be kept in good order. Follow the manufacturer's maintenance instructions and replace consumable items, such as lifting pads, before they become unsafe.
- Make sure employees evenly balance the lift for different types of vehicle (ie varying the position according to its centre of gravity and the lift type).
- In addition, for two-post lifts make sure employees:
 - check that the arm locks show no signs of damage or deterioration to their locking teeth and that they engage fully as the vehicle is lifted;
 - check the vehicle is secure by lifting to about a metre, confirming the lifting pads are positioned correctly, and then rocking the vehicle;
 - use proper pad extensions where required, not blocks of wood;
 - use props for additional vehicle support when removing heavy components.

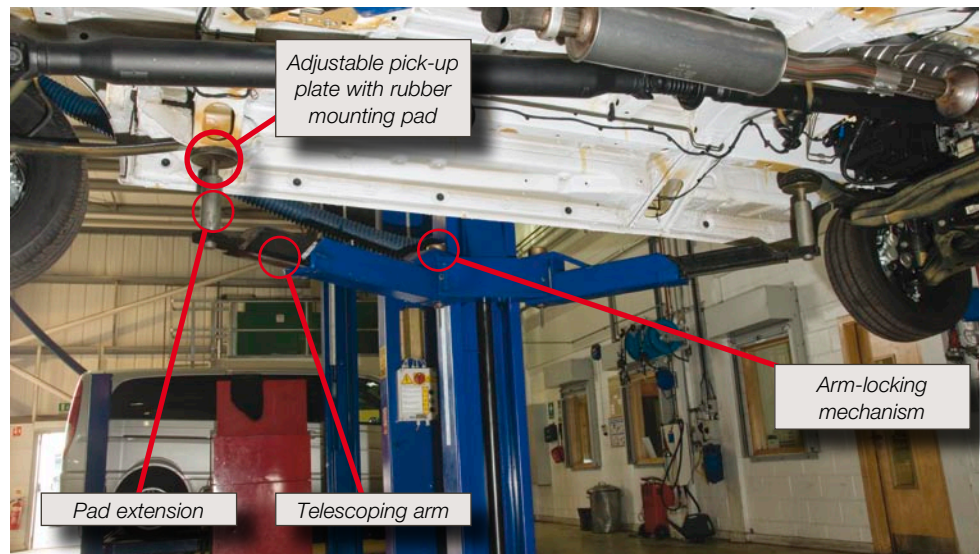


Figure 3 Key parts of a vehicle lift

Check equipment regularly and get it inspected

A worker was standing at the end of a raised four-post lift and pulled the car towards him. There were no end-stops on the lift and he was unable to stop it falling off the lift onto him. He died in hospital from crush injuries. The lift had not been thoroughly examined and tested.

A two-post lift was being operated by an employee while the owner worked beneath it. A drive nut failed and the vehicle fell onto the owner, killing him. The safety back-up nut had become detached a long time earlier. The lift had not been thoroughly examined and tested.

Key precautions

- Vehicle lifts need to be thoroughly examined periodically by a competent person, who should issue a 'Report of Thorough Examination'. It is recommended that this is done every six months. Although this should identify problems, it is not a replacement for regular in-house checks and maintenance – in the same way that you shouldn't rely on an MOT to keep your vehicle roadworthy.
- Every year, get lifting equipment such as trolley and bottle jacks thoroughly examined and tested and inspect props and axle stands.



Figure 4 Hinged end-stops help prevent the vehicle falling from the lift when elevated

Take extra care when working away from the workshop

A tyre fitter went to change six tyres on a school coach parked on a sloping car park. Both rear nearside wheels and one offside wheel had been removed and he was in the process of jacking it up when it fell onto his head and chest, killing him.

A mechanic was working underneath a van attempting to free a seized handbrake. He managed to release it but the van, which was parked on a slope, rolled forward, crushing him to death.

Key precautions

- Make sure the ground is firm and level before raising a vehicle.
- If the area is unsuitable, move the vehicle to a safer place before attempting to lift it.

Always prop cabs and tipping trailers

A worker replaced a valve on the lifting ramp of a car transporter. Another worker checked the pressures on the vehicle, then leaned over the side of the trailer and was crushed to death when the deck descended.

Key precautions

- Always prop cabs, trailers etc that could drop under their own weight.
- If there is no prop fitted, or if one is fitted but you are unsure it will be effective, provide your own.

Don't work beneath a vehicle with air suspension unless you prop it first

A coach pulled into a garage with air suspension problems (later found to be an intermittent wiring fault). An experienced mechanic went underneath without propping the vehicle. While he was there, air was released (probably by the mechanic working on the suspension unit) and the coach dropped, crushing him. He suffocated to death.

A worker was recovering a broken-down bus from the roadside. While underneath the vehicle and winding the back brakes off, the suspension airbag on the bus blew and the bus came down and crushed him to death.

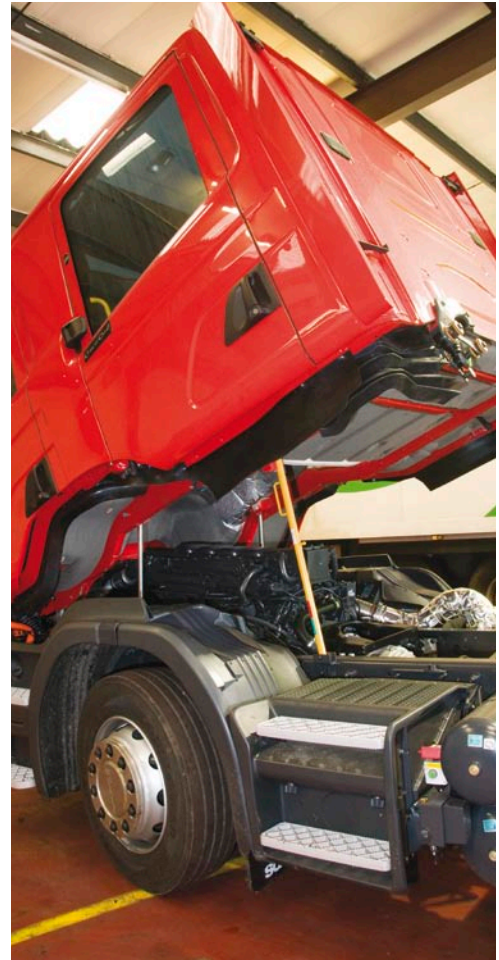


Figure 5 Prop for an HGV cab



Figure 6 Props for a tipper lorry

Key precautions

- Never crawl beneath a vehicle fitted with air suspension unless it is properly supported.
- Don't tamper with the ride height for the purpose of recovery or repair.



Figure 7 Limited clearance even with full suspension

Ensure everyone working on a vehicle knows the safe systems of work

A mechanic was crushed to death when working beneath a vehicle. Another employee turned the ignition while it was in first gear and the handbrake was off, causing the vehicle to move forward.

A trainee and his supervisor were trying to find a problem with a van that required the engine to be running. The trainee went under the vehicle to investigate. The supervisor moved the van while the trainee was still underneath it and crushed him to death.

Key precautions

- Where possible, the person working beneath the vehicle should remove and keep the starting control (eg ignition key).
- If the engine needs to be running, have a safe system of work to stop the vehicle moving (eg chock the wheels and make sure there is good communication between workers).

Take care when working in or near pits

A self-employed garage owner was found dead in a vehicle inspection pit. There was a car over the pit with the engine running. It is believed he was repairing the exhaust pipe when he was overcome with carbon monoxide fumes.



Figure 8 Extendible barriers warn workers about the open pit area

A bus driver parked his vehicle in the designated garage area. Taking a short cut through the bus maintenance area, he looked back at the bus to make sure it was parked straight, and fell into an unguarded maintenance pit. He died later in hospital.

Key precautions

- Restrict access to the pit area to people who need to be there.
- Where practical, cover pit openings when they are not in use.
- Where necessary, provide safe access across open pits.
- Use extendible barriers, chains etc to warn about open pits.
- Make sure pits are clearly visible.
- Provide safe means of entry and exit.
- Don't weld, work on air conditioning or leave engines running over pits unless there is effective extraction.

Take extra care with roadside repairs

An HGV recovery fitter was crushed to death under the air-lifted axle of a tractor unit he was attempting to rescue from the roadside. No supplementary supports were used.

An HGV driver crawled beneath a truck to position a vehicle jack before carrying out a roadside repair. The vehicle moved forward slightly, pinning him to the ground and killing him.

Key precautions

- Make sure that workers know what actions they are expected to take in the event of a breakdown.
- Don't carry out specialist work unless you have received appropriate training and have the necessary equipment.
- It may be safer to tow the vehicle to a workshop than attempt a roadside repair.

Don't add to the risk

While working in a vehicle inspection pit repairing a fuel leak, a worker was killed when a fire/explosion occurred.

A worker was killed while carrying out hot work beneath a vehicle. A fire started in the fuel system and spread to the petrol tank, which exploded.

Petrol was being drained from the petrol tank of a vehicle raised on a lift in a small garage. Two workers were killed and two were critically injured when the petrol ignited.

Key precautions

- Don't carry out pit work on non-diesel tanks or associated fuel lines where there is a risk of release.
- Don't carry out any hot work (welding, cutting etc) on or near any tank or fuel line, including diesel systems.
- Where possible, use a fuel retriever when removing petrol (see Figure 9).



Figure 9 Fuel retriever – note metal collection tank and earthing straps

Need to know more?

Health and safety in motor vehicle repair and associated industries HSG261
HSE Books 2009 ISBN 978 0 7176 6308 8 www.hse.gov.uk/pubns/hsg261.htm

You can find more advice on health and safety in the motor vehicle repair industries at: www.hse.gov.uk/mvr.

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at www.hse.gov.uk/pubns/indg434.htm.

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