



GUIDANCE FOR MANAGING THE RISKS ASSOCIATED WITH END OF LIFE PETROL (ULP) VEHICLES

LET'S TALK SAFETY

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PROPERTIES AND HAZARDS OF PETROL

Petrol is an extremely volatile liquid, which gives off flammable vapours at very low temperatures – down to about minus 40 °C. When mixed with air, these vapours can form a flammable atmosphere that will readily burn or explode if an ignition source is present. A mixture containing between about 1% and 8% of petrol vapour is flammable.

Petrol vapour is heavier than air. It does not disperse easily in still air conditions and tends to sink to the lowest level within its surroundings. It may accumulate in tanks, cavities, pits or other depressions. Accumulations of vapour in enclosed spaces or other poorly ventilated areas can persist for a long time, even where there are no visible signs of the liquid itself.

Flammable vapours will be released when petrol is handled, extracted from vehicles, transferred between storage tanks, drums or cans, and whenever petrol is spilt or exposed to the air. A flammable atmosphere will exist above the liquid in tanks or cans and will even remain in such containers for long periods after they have been emptied of any liquid.

CONTROL MEASURES – GENERAL PRINCIPLES

The measures selected for the recovery of fuel should be appropriate to the nature of the activity or operation. They should ensure the risk of a fire or explosion is reduced to be as low as is reasonably practicable by:

- reduce the quantity of petrol being recovered to a minimum
- avoid or minimise releases of petrol or its vapour
- control releases of petrol at source
- prevent the formation of flammable concentrations of vapour
- collect, contain and remove any releases to a safe place
- avoid ignition sources and other adverse conditions
- segregate incompatible substances.

Having decided on measures to minimise the occurrence of a fire or explosion, you also need to consider whether it is still possible for them to occur, and what additional measures you may need to put in place in order to mitigate their consequences. Examples of measures to limit harm to employees from a fire or explosion may include:

- reduce the number of employees exposed to a minimum;
- prevent fires and explosions from spreading to other plant and equipment or to other parts of the workplace;
- provide plant and equipment that can safely contain or suppress an explosion, or vent it to a safe place
- provide suitable personal protective equipment.
- Ensure that the battery has been disconnected and removed from the vehicle prior to removing the fuel tank

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The safety data sheet should always be referred to for guidance on what personal protection equipment should be used. Generally the requirements are as follows. Safety glasses with side shields or chemical goggles for eye protection. Wear chemical protective gloves e.g. PVC for hand protection. Wear safety footwear or safety gumboots e.g. rubber for feet protection. Overalls, PVC apron or PVC suit maybe required if exposure is severe. An eye wash unit and a safety shower should be readily available. If personnel are required to work in areas where the concentration of gas/ particulates in the breathing zone approaches or exceeds the exposure standard respiratory protection should be used complying with AS1715 and AS1716.

VENTILATION

In order to disperse any releases of petrol that may occur, it is important that good ventilation is provided where the extraction equipment is operated. Installing or locating the extraction equipment in open fronted buildings, or within buildings close to the open doors provided for vehicle access, will achieve satisfactory levels of ventilation. Where you cannot position the equipment next to open access points, or you wish to keep the access doors closed, you will need to incorporate additional ventilation to give at least six complete air changes per hour in the vicinity of the equipment. This can be provided by mechanical exhaust ventilation (with suitably placed motors or protected electrics) or louvered openings at high and low level near to the equipment.

EQUIPMENT

Extracting petrol from a vehicle fuel tank is a potentially hazardous operation. You will need to ensure that any equipment is designed and operated to minimise releases of petrol or vapour during normal operation and in case of mechanical failure or operator error. The equipment must also be provided with adequate ventilation to disperse any petrol releases and be designed to control any ignition sources.

Equipment supplied specifically for extracting petrol and other pollutants from vehicles must be designed so as to comply with the essential health and safety requirements.

The equipment should also be designed to allow safe means of ingress and egress from the working areas, and any raised working platforms or gantries should be provided with handrails to prevent falls.

If you, as an employer, construct a depollution rig for your own use, then you will take on the duties of the supplier and will need to comply with the relevant WHS legislation.

PETROL RECOVERY SYSTEM

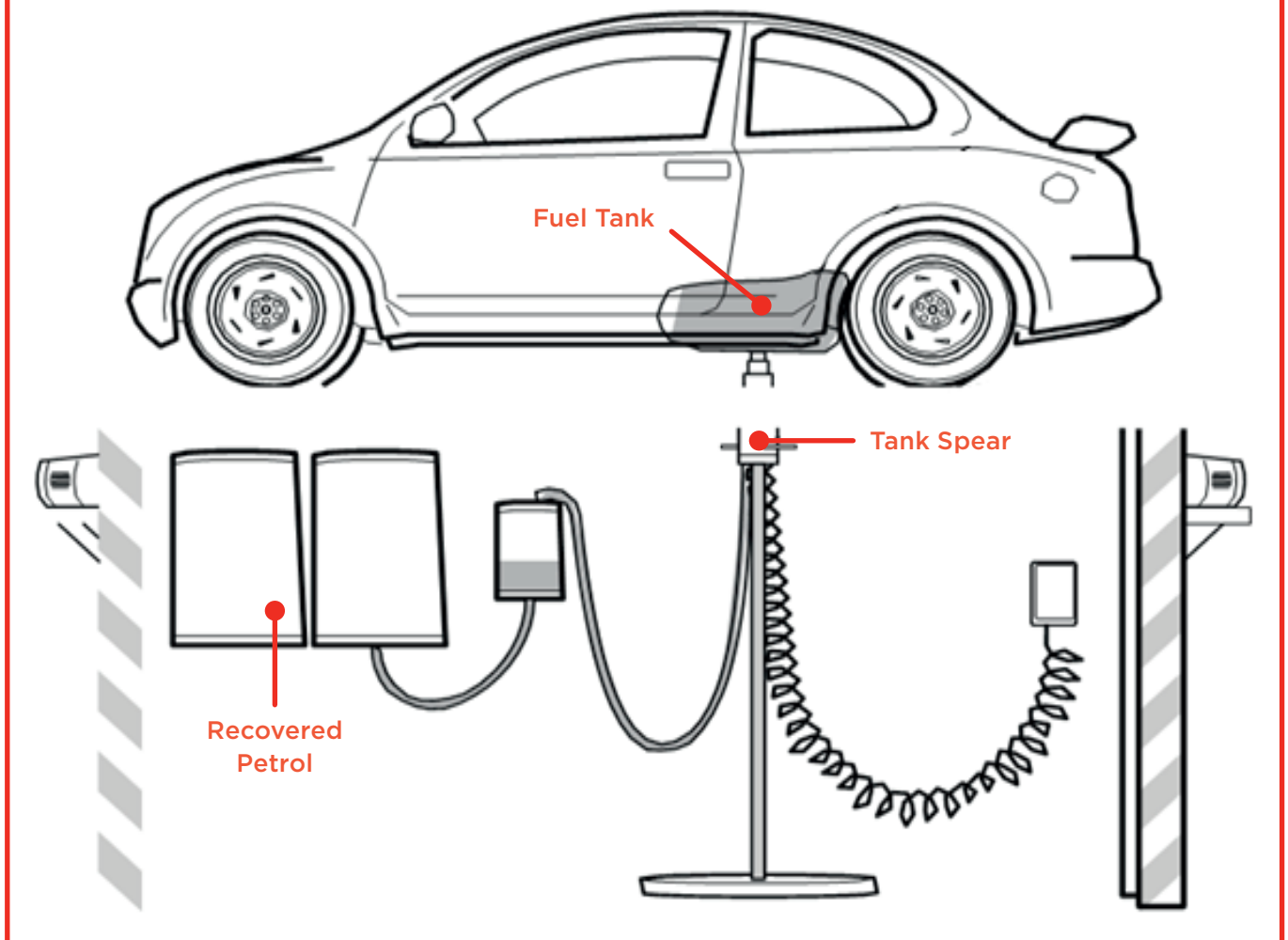
'Hazardous area' is a term used to define those parts of a site or factory where flammable concentrations of vapours or gases may occur, and where special precautions are necessary to control ignition sources. However, the first approach to safety at any site involving a flammable material such as petrol, is to control its storage and use, so as to minimise the type and extent of any hazardous area.

The type and extent of any potential hazardous areas should be minimised firstly by establishing controls that limit or prevent any releases of petrol or its vapour, and then by applying ventilation measures, as appropriate, to disperse and dilute any releases that could occur. Those places where flammable concentrations of vapours can still arise, under either normal conditions or during foreseeable faults, are deemed to be hazardous areas. A warning sign should normally be provided to indicate the presence of any hazardous areas.



Hazardous area

Typical but not definitive 3 meter exclusion zone



PETROL EXTRACTION

Ideally, you should extract petrol from existing fuel tank openings to minimise the risk of spills and frictional ignition sources. However, in developing suitable methods, it has been found that such extraction processes can be inefficient and do not always remove all of the petrol. Consequently, some processes involve penetrating the tank base to extract the fuel. Your extraction procedure should ensure that:

- where reasonably practicable, the tank penetration mechanism cannot be operated unless the fuel extraction is operating;
- there is a clear indication of the necessary operating pressures or vacuums for safe use of the equipment
- the tank penetration mechanism does not create sparks or frictional heating capable of igniting petrol vapours; drilling components cannot pull out from the tank under their own weight if they are left unsupported (this may involve operational procedures to disconnect heavy motor units from the drill)
- forward and reverse controls on drills are clearly indicated, to minimise incorrect operation and to prevent partly formed drill holes that cannot be sealed.

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You should exclude all ignition sources from the hazardous area

You should pay particular attention to ensuring that:

- drills have protected electrics or are pneumatically powered;
- pumps have protected electrics or are pneumatically powered;
- lights (including inspection lamps) have protected electrics;
- smoking materials and other obvious ignition sources are excluded;
- antistatic footwear & clothing is worn.
- earth bonding is provided.

Bonding is used to reduce the risk of electric shocks to anyone who may touch two separate metal parts when there is a fault somewhere in the supply of electrical installation. By connecting bonding conductors between particular parts, it reduces the voltage there might have been. If a failure of electrical insulation occurs, all bonded metal objects will have substantially the same electrical potential, so that a person cannot touch two objects with significantly different potentials.

Spillage control

All areas where petrol is handled, or where potential leaks or spills can occur, should be provided with a means for controlling spills and preventing them spreading to other non-hazardous areas. Recessed and gridded drip trays may be provided, but petrol and other liquids should not be allowed to accumulate within them.

An inert, absorbent material, such as sand, vermiculite or a proprietary material, should be provided to aid the prompt treatment and disposal of any petrol spills or leaks.

Petrol can be particularly hazardous if it is spilt onto clothing, as it lingers in the fibres of the material for a long time – even after any visible signs of the spill have disappeared. Such contaminated clothing is easily ignited by common ignition sources such as smoking materials, naked flames or sparks, giving rise to a serious fire that often results in fatal or major injuries.

Petrol floats on water and, if spilt or leaked into the ground, can be carried long distances by watercourses, ducts, drains or groundwater. This can lead to a fire or explosion hazard some distance from where the actual petrol was released.

BEST MANAGEMENT PRACTICES FOR FUEL TANK DISPOSAL

- Remove fuel from vehicle fuel tanks as soon as possible after vehicles arrive at the facility.
- Do this before you remove the tank from the vehicle.
- If a small amount of fuel remains in the tank after it is removed from the vehicle, carefully pour it into an approved fuel storage container. Use funnels and drip pans to avoid spills.
- Remove the in-tank fuel pump and wires.
- Allow empty fuel tanks to fully ventilate before crushing them, in order to reduce the potential for explosion.

- Store fuel tanks in a well-ventilated area that is protected from rainfall.
- Do not store un-drained fuel tanks. They are a fire and explosion hazard, and can leak.
- Do not crush a vehicle if the fuel tank is still attached and has not been rendered safe by flushing and ventilating.
- Have the fuel tank scrap pile removed on a regular basis.
- Do not store fuel tanks for very long periods of time.
- Ensure that any plant used to crush or shred vehicles while the petrol tank is in place (but emptied) is fit for purpose.

EMERGENCY PROCEDURES

Train all staff in the emergency arrangements for events such as spill containment, a vehicle or petrol fire. Ensure emergency equipment such as fire extinguishers are strategically located, appropriate for the task and serviced as per the manufacturers requirements.

All operational and emergency procedures should be reviewed regularly. You should amend them to take into account any changes or modifications and any practical experience arising from spills or other incidents.

SOURCES OF INFORMATION

SafeWork NSW,
Tel: 131 050 www.safework.nsw.gov.au

Fire & Rescue NSW
Tel: 02 9265 2999 Email: info@fire.nsw.gov.au

Supporting standards

AS/NZS 60079 – Explosive atmospheres
 AS/NZS 1841 – Fire extinguishers
 AS/NZS 1715 – Selection, use and maintenance of respiratory protective equipment
 AS/NZS 1716 – Respiratory protective devices
 AS/NZS 2906 – Fuel containers
 AS1940:2017 – The storage and handling of flammable and combustible liquids

