

WASTE VEHICLES

This fact sheet is part of a series of fact sheets to support the implementation of the environmentally sound management (ESM) of hazardous wastes and other wastes, in accordance with the obligations of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

The fact sheet provides information on the environmentally sound management of waste vehicles, also sometimes referred to as “end-of-life vehicles”. It is primarily intended for use by dismantlers and recyclers.

Other fact sheets in the series provide related information on waste oils, waste lead acid batteries, waste tyres and electrical and electronic waste. Technical guidelines have been developed under the Basel Convention for the environmentally sound management of used and waste pneumatic tyres⁽¹⁾, waste oils⁽²⁾, and waste lead-acid batteries⁽³⁾, among others.

Classification

Waste vehicles that have been drained of fluids (e.g. engine oil) and are free of other hazardous components (e.g. lead acid batteries) are classified under entry B1250 of Annex IX to the Basel Convention, when subject to transboundary movement. Table 1 indicates fluids and components that are generally removed from waste vehicles during dismantling⁽⁴⁻¹²⁾ and their classification under Annexes I, III, VIII and IX of the Basel Convention. Also identified therein is the applicable hazard class or division under the United Nations Model Regulations⁽¹³⁾.

Storage

Waste vehicles should be stored in properly licensed, permitted or authorised facilities. Storage of vehicles, even temporarily, should be undertaken on an impermeable surface with spill containment. Spillage collection facilities should include a sealed drainage system as the primary means of containment, however, spill kits to deal with spillages of oils, fuels and acids should be provided and used as appropriate⁽⁶⁾. Devices such as silt traps and oil separators should be provided for the treatment of storm water runoff. If engines or greasy parts are exposed, they should be covered with a tarpaulin or other covering to prevent rain and snow contact⁽⁹⁾.

Storage sites should be secured in order to prevent unauthorised access, and to ensure that no material can escape⁽⁶⁾. An inventory should be kept of the waste vehicles stored at the facility. The make, model, and year of each vehicle, the date the vehicle arrived, the date it was last inspected for leaks, and other information needed to control the flow of the inventory, should be recorded⁽⁹⁾.

Environmentally sound waste management

Waste vehicles should only be handled in properly licensed, permitted or authorised facilities that employ environmentally sound management (ESM) practices.

When waste vehicles first arrive at a facility, they should be inspected for leaks and unwanted materials that could have been placed in the vehicle^(9,14). Any oil or fluid leaking from the vehicle should be

Environmentally sound management (ESM) of hazardous wastes or other wastes, as defined in the Basel Convention, means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes.

collected immediately using drip trays. Vehicles that are leaking should be moved immediately to the dismantling area and processed⁽⁸⁾.

Runoff management is an important consideration for waste vehicle dismantlers. Best practices to prevent or minimise pollutants from entering storm water runoff and/or reduce the volume of storm water requiring management include, among others, regular clean-up, collection and containment of debris in storage areas, and other housekeeping practices, spill control, and employee training⁽¹⁴⁾. Best practices for minimising exposure of potential pollutant sources to precipitation include covering materials or activities with temporary covers (e.g., tarpaulins) or permanent covers (e.g., roofs).

Examples of waste categories	Y-code, annex I of Basel Convention	H-code, annex III of Basel Convention	A-code annex VIII or B-code annex IX of Basel Convention	United Nations shipping name, number, and hazard class or division
Waste lead-acid batteries	Y31,Y34	H8, H11, H12, H13	A1160	Waste Battery, Wet, Filled with Acid, UN2794, Class 8 -or- Waste Battery, Wet, Non-spillable, UN2800, Class 8
Waste lead-acid batteries, drained	Y31	H11, H12, H13	A1160	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Waste battery electrolyte	Y34	H8	A4090	Waste Battery Fluid, Acid, UN2796, Class 8
Waste lithium batteries	Y19	H13	A1170	Waste Lithium Ion Batteries, UN 3480, Class 9
Waste tyres	-	-	B3140	-
Waste mercury switches	Y29	H11, H12, H13	A1030, A1180	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Waste oils	Y8	H11, H12, H13	A3020	Environmentally Hazardous Substances, Liquid, N.O.S., UN3082, Class 9
Petrol (fuel)	Y9	H3, H11	A4060	Petroleum Products, N.O.S., UN1268, Class 3
Waste antifreeze	Y42	H11	A3140	Environmentally Hazardous Substances, Liquid, N.O.S., UN3082, Class 9
Waste catalytic converters that contain refractory ceramic fibre (RCF)	-	H11	-	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Waste electrical and electronic assemblies or equipment (e-waste)	Various (e.g., Y31, Y20, Y27, Y45)	H11, H12, H13	A1180	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Non-hazardous waste electrical and electronic assemblies	-	-	B1110	-
Non-deployed airbags	Y15	H1	-	Safety Devices, Pyrotechnic, UN0503, Division 1.4G -or- Safety Devices, Electrically Initiated, UN3268, Class 9
Waste brake pads containing asbestos	Y36	H11	A2050	Waste Asbestos, Chrysotile, UN2590, Class 9
Metal and metal-alloy wastes	-	-	B1010	-

H1=Explosive; H3=Flammable liquids; H8=Corrosives; H11=Toxic (delayed or chronic); H12=Ecotoxic; H13=Capable, by any means, after disposal of yielding another material which possesses any of the characteristics listed in Annex III

Table 1. Classification of components of waste vehicles

Contaminated runoff should be treated prior to discharge with devices such as oil-water separators⁽¹⁴⁾. Oil-water separators should be cleaned out on a regular basis (twice a year at a minimum)⁽⁸⁾.

Dismantling

Any dismantling involving the engine, transmission or hydraulic systems should take place on impermeable surfaces with a sealed drainage system as a primary means of containment. However, spill kits to deal with spillages of oils, fuels and acids should be provided and used as appropriate. Waste vehicles may be dismantled on hard-standing surfaces only if the dismantling is of

parts not associated with, and the dismantling activity will not disturb, the engine, transmission or hydraulic systems⁽⁶⁾. Oil-water separators should not be used as part of the spill control strategy⁽⁸⁾.

De-pollution activities should be conducted using tools and equipment designed specifically for carrying out the required operations. The use of such equipment is generally considered to yield the best results as it ensures that a high level of de-pollution can be achieved in a relatively short time frame, generally 20-30 minutes⁽⁵⁾.

Dismantling operations include parts removal and vehicle de-pollution (the removal of fluids and hazardous components prior to crushing or shredding) to various degrees. In order to de-pollute a waste vehicle, a number of operations have to be conducted, the sequence of which may vary depending on the vehicle. A possible sequence (developed from practical trials using one specific make of vehicle) is presented in Figure 1⁽⁵⁾. Model-specific information (such as airbag deployment instructions, identification of mercury-containing components, and information about potentially reusable parts and components) should be obtained from vehicle manufacturers (e.g. IDIS⁽¹⁵⁾).

After de-pollution, all gravity-drained holes should be plugged, either with their own drain plug or a suitable plastic bung, to prevent any residual leakage⁽⁵⁾.

Fluid storage should be confined to designated areas that are covered and have adequate secondary containment. Containers should be kept closed, except when adding or removing fluids, and they should be inspected regularly to check for leaks, cracks, or structural deficiencies⁽¹¹⁾.

Fluids of differing types should be stored in separate containers prior to being collected and treated by specialist disposal companies⁽⁵⁾. Fluids should be properly segregated and stored to promote their recovery. Waste vehicle dismantlers should check with the recycler to determine what materials may be mixed (so as not to restrict the possibilities for recycling). Generally, waste oils (e.g. lubricating, transmission, power steering and shock absorber oils) can be mixed together and stored in the same container. Waste oils should not be mixed with waste solvents or products that contain halogen compounds. At a minimum, for fuels (petrol and diesel), oils, brake fluids and antifreeze should be kept in separate containers⁽⁵⁾.

Waste oils and waste antifreeze should be stored in steel drums⁽⁸⁾. Although plastic containers are acceptable, the plastic deteriorates over time and will eventually fail. Also, plastic containers are more susceptible to puncture.

Fuels should be stored in a separate, well-ventilated area. Consideration should be given to the installation of a suitable storage tank (designed and constructed to an appropriate national or international standard) if the amount of petrol to be stored is more than 1000 litres of petrol⁽¹⁶⁾.

Mercury-containing convenience lighting assemblies (or mercury switch capsules) and ABS sensor modules should be stored in plastic containers with airtight lids^(11,17). Containers should be kept closed, except when adding an assembly or pellet. All employees who remove and/or manage mercury-containing switches should be aware of proper handling methods and emergency procedures for containing and cleaning up mercury spills and leaks. It is recommended that all facilities have a mercury spill kit.

Asbestos-containing brake shoes or clutches should be removed using specially designed, low-pressure spray equipment that wets down brake or clutch dust and properly catches the runoff to reduce the chance of asbestos being released into the air.

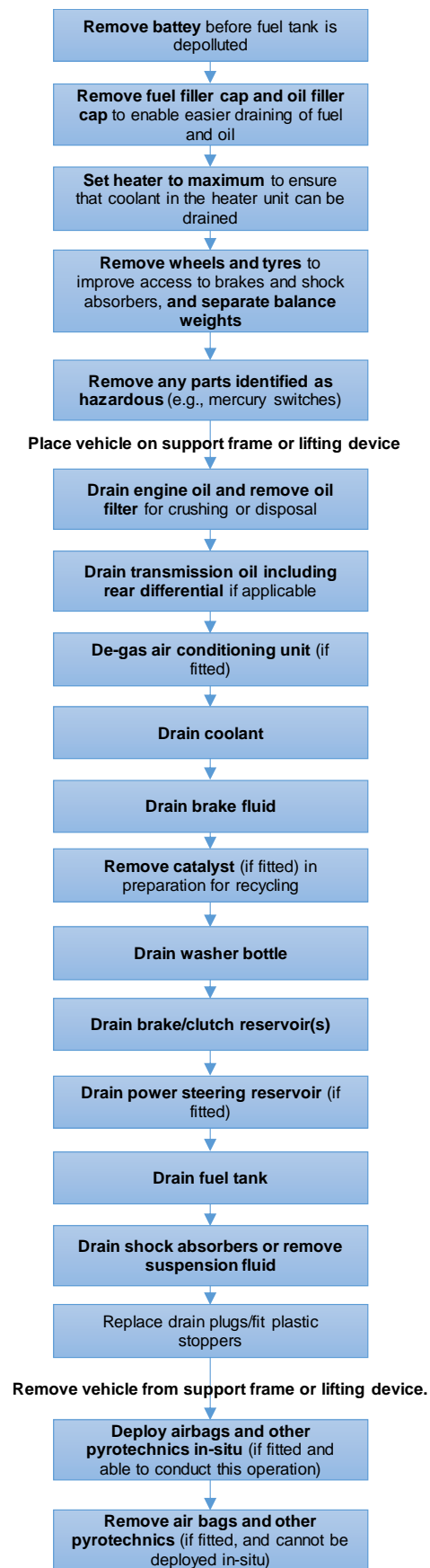


Figure 1. Example of the de-pollution process⁽⁶⁾

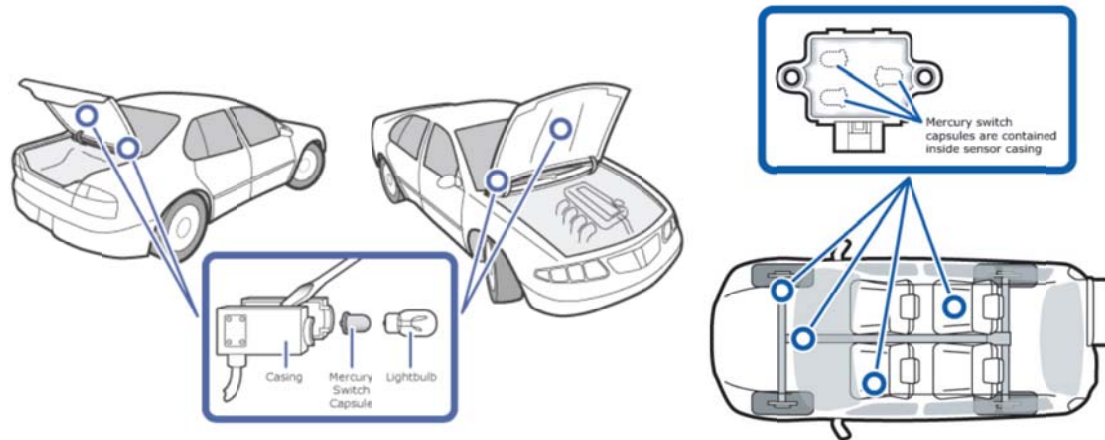


Figure 2. Location of mercury convenience lighting switches and ABS sensor modules (Source: www.switchout.ca)

The use of a high-efficiency particulate arrestance (HEPA) filter vacuum cleaner should be considered. Asbestos-containing brake shoes and clutches should be placed in a heavy plastic bag, double tied, and stored in a leak proof, airtight container designated for asbestos waste⁽¹⁹⁾. Appropriate containers should be provided for any other hazardous components identified and removed from waste vehicles.

It is recommended that, where possible, airbags be deployed in-situ by trained technicians and using appropriate safety protection. Airbags can be deployed safely by using vehicle manufacturer information on airbag management. Non-deployed airbag units should be removed and not go through the shredding process. Seatbelt pre-tensioners that contain explosive devices also need to be deployed as part of the de-pollution procedure⁽⁵⁾. Non-deployed air bag modules and inflators removed from vehicles should be managed in a manner that prevents them from being accidentally deployed. They should be stored in a cool dry location with appropriate fire protection. Airbag modules should be stored cover side up and not stacked⁽¹⁸⁾.

Catalytic converters, metal parts containing copper, aluminium or magnesium, tyres, glass and large plastic components (e.g., bumpers, dashboard) should be removed for recycling in the dismantling stage, if they cannot be segregated in the shredding process in such a way that they can be effectively recycled⁽⁴⁾. Catalytic converters that contain refractory ceramic fibre (RCF) should be stored in a manner that does not result in the metal casing being pierced or breached (e.g., stored in a rigid container).

Storage should be carried out in such a way as to avoid damage to components which contain fluids or to recoverable components and spare parts. Engines, transmissions and other oily parts should be stored under a tarpaulin, roof, or other temporary or permanent cover and on an impermeable surface, or in a covered weather-proof container such that there is no contact with rainfall and surface drainage⁽¹¹⁾. Parts

removed for resale should be stored on racks where practical. Prevention of fire hazards and of excessive stockpiling should be considered when storing used tyres. Generally, no more than 2 vehicle loads of tyres should be stored⁽⁶⁾.

Engines and parts should only be washed if absolutely necessary. Solvent cleaning of parts should be conducted in a solvent-based parts washer⁽²¹⁾. Cleaned parts should be drained for at least 15 seconds, or until dripping ceases, whichever is longer; parts should be covered during drainage⁽²⁰⁾. To prevent evaporation washers should be covered when not in use and circulating sinks should be turned off^(19,22). To keep the solvent cleaner longer, the use of parts washers equipped with filters and other separation and treatment options should be considered. Also, segregating cleaning into two stages, each having a dedicated washing unit, can extend the usefulness of the solvent⁽¹⁹⁾. An on-site distillation unit to recycle waste solvent may be considered to further reduce solvent use and waste^(19,21). Waste solvent should be stored in covered containers; solvents and degreasers should not be mixed with oils or with fuels.

Crushing

Vehicle crushers and drain racks should be situated on a bunded or self-contained impermeable surface, preferably under a roof and protected from the weather. The floor surface should be sloped to contain fluids. Mobile crushers should always be situated on an impermeable surface. Containers designed to be fitted to the crusher can help capture fluids^(19,20).

Waste vehicles should be adequately drained prior to crushing. The fluids that drain from the crusher reservoir should be collected and disposed of properly.

Shredding

Shredding involves the actual shredding of materials into smaller pieces as well as the separation and sorting of the material once shredded for acceptance by other operations like a steel mill for metal recycling.

To reduce potential emissions, which may include POPs released from materials that were not properly removed during de-pollution, systems for dust suppression (e.g. wet shredding) or dust collection (e.g. cyclones) should be considered.

The amount of auto shredder residue (ASR) that would eventually need to be finally disposed of can be reduced significantly by separation and recovery of materials from the shredder residue, primarily plastics, rubber, and residual metals, including the reprocessing of the finer fraction. The non-combustible fraction can also be reduced by separating and recovering the metals and their oxides and perhaps the glass.

For the treatment of ASR, several options are available e.g. post shredder technology that separates materials from ASR for recycling. Specific attention should be paid to plastics as these may be contaminated with POPs. ASR may be incinerated and in such cases, incineration should take place in facilities that practice ESM. If incineration is not available, ASR may also be disposed of in a controlled (engineered) landfill.

Extended Producer Responsibility

Extended producer responsibility (EPR) extends a producer's responsibility for a product to the post-consumer stage of its life cycle. Effective EPR implementation depends on the participation of all the actors in the product chain. Dismantlers and recyclers who participate in an EPR programme and follow its requirements are generally required to meet certain standards or use best management practices for handling products and materials.

All waste vehicles should be managed according to ESM practices, whether or not they fall under an EPR scheme (e.g., waste vehicles being sold directly to a recycler).

Certification and Auditing Systems

Environmental management systems (EMS) can help organisations identify and manage their environmental impacts as well as compliance with environmental legislation. Dismantlers and recyclers can become certified (e.g., using ISO, EMAS or industry standards) by demonstrating to an accredited, independent, third-party auditor that they meet specific standards to safely manage waste vehicles. An organization can, however, achieve the same benefits from an EMS whether or not it pursues certification. Non-standardised systems can in principle be equally effective provided that they are properly designed and implemented.

See reference section for general guidelines and recommendations to help small and medium-sized businesses develop an EMS⁽²⁴⁾.

Transboundary Movements

Transboundary movements of waste vehicles that are hazardous wastes are subject to the Basel Convention control procedure and should be reduced to a minimum consistent with environmentally sound and efficient management and conducted in a manner which will protect human health and the environment. In addition, waste vehicles may be subject to additional restrictions and control procedures in certain countries. In some cases, it may be difficult to distinguish used vehicles from waste vehicles⁽²⁵⁾. Contact should be made with the relevant competent authorities for further information.

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