

Tools And Equipment 1














Index

Subject	Page
Safety, signs	4
Environmental aspects	6
Tools, general overview	8
Correct usage of wrench and screwdriver	11
Torque wrench and hydraulic press	12
Tap and die	14
Garage jack, rigid rack and auto lift	16
Tools, miscellaneous	17
Bolts, screws and nuts	18
Bolt and nut size indication	20
Bolt and nut tightening torque	21
Bolt property class	22
Corrective steps against tightening failures	23
Washers, pins and keys	24
Gears	25
Bearings	28
Vernier caliper	32
Micrometer	34
Dial gauge	36
Cylinder gauge	37
Feeler, threading and plastic gauge	38
Jumper wires and plug tester	40
Digital Multimeter	41
Measuring voltage and resistance	43
Current measurement	46
Diode check	49
Analog Multimeter	50
Battery / charging system analyzer	52
Workshop manuals	61

HI-SCAN Pro	62
HI-SCAN Pro, package	63
HI-SCAN Pro, optional kit	65
HI-SCAN Pro, safety precautions	67
HI-SCAN Pro, configuration and connection	68
Key pad, on-off operation and initial screen	70
HI-SCAN Pro, menu tree	72

Safety, signs

Warning	Meaning	Warning	Meaning	Prohibition	Meaning
	High voltage		Danger of explosion		No open fire
	Flammable		Warning		No smoking
	Fork-lift truck traffic		Corrosive		No pedestrians
	Toxic				Don't use water to extinguish a fire

Warning Signs:

A warning sign indicates a hazard. In most countries warning signs take the shape of an equilateral triangle with a thick black border and a yellow background. The most common types of warning signs are shown on the slide.

Prohibition Signs:

Prohibitory signs are used to prohibit certain types of action, for example smoking. The most common prohibition signs are shown on the slide.

Escape	Meaning	Advise	Meaning
	Way out with direction to follow		Wear gloves
	First aid		Wear earplug
	Way out with direction to follow		Wear Safety Shoes
	Way out with direction to follow		Wear Safety Glasses



Always wear Safety Shoes



Use Safety Glasses (where required)

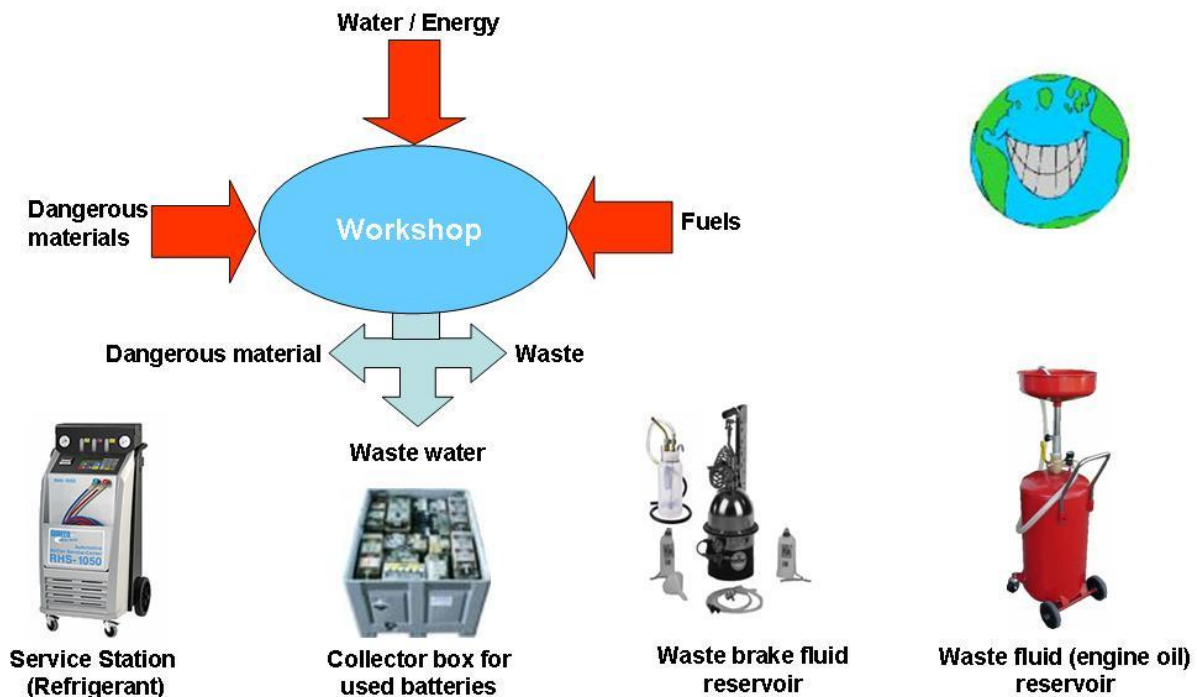
Escape Signs:

Escape signs show the way out of a unpleasant situation, such as fire. The most common escape signs are shown on the slide.

Advice Signs:

Advice signs are used to improve working safety and are located in areas where the usage of safety equipment, such as gloves or safety glasses, is required. The most common signs are shown on the slide.

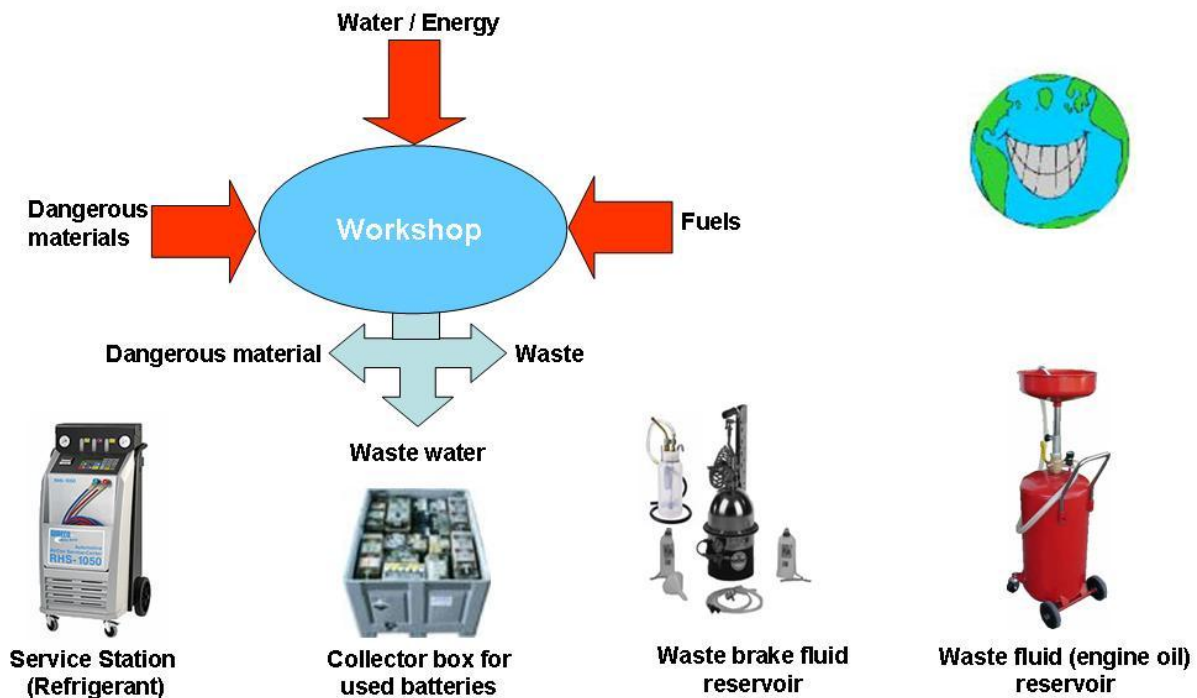
Environmental aspects



In almost any dealership a workshop is present, having the largest and most complex impact on the environment. The diagram illustrates the different environmental relevant aspects. An aspect with special meaning is the waste water. Among other things it can be contaminated with gasoline, oil and heavy metals such as copper, lead, nickel, cadmium, tin and zinc. If waste water is led into drains, then a pretreatment with a light media separator is required. Please take note of local regulations!

Service:


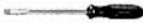










The vehicle maintenance is the main business of the automobile workshop. Apart from the regular vehicle maintenance, owners of a vehicle visit workshops also due to material wear. It is important to mediate to the customers that the exchanged fuels and vehicle parts are recycled according to pollution free criteria's.



Inspection and parts replacement:

The range of the inspection varies depending upon model and odometer reading. It generally concerns however particularly functional tests as well as the exchange of parts and operating liquids. Dripping losses should be avoided as far as possible. With the exchange of fuels such as engine oil, brake fluid etc., waste oil results. To this dangerous material special requirements apply regarding handling and disposal. When discharging the oil suitable and safe devices should be used for catching, e.g. mobile receptacles. Alternatively also withdrawal systems for waste oil can be installed. Buried oil must be taken up immediately with suitable bonding agents. The waste oil collector must fulfill the danger-good-legal requirements.

Tools, general overview

Picture	Description	Picture	Description	Picture	Description
	Wheel lug wrench		Slit screwdriver		Adjustable plier
	Ratched wrench box		Phillips tip screwdriver		Grip wrench
	Vice		Adjustable wrench		Round nose pliers
	Hammer		Combination pliers		Wire cutter

A tool is a device that provides a mechanical or mental advantage in accomplishing a simple machine, or a combination of them. Hand tools are devices for doing a particular job that does not use a motor, but is powered solely by the person using it. Examples are almost endless, from general tools like the hammer to specific tools like calipers.

The most common tools used within the automotive trade are shown on this slide.

For the repair of a vehicle various tools are required, most of them available in different shapes and sizes. For the repair of a vehicle, a variety of tools are needed, most of them available in different shapes and sizes.