



## SAFE WORK GUIDELINES

# Removing Engines

Removing engines exposes you to hazards from gasoline, solvents, other flammables, oils, other lubricants, Freon and sulphuric acid as well as improper use of tools and awkward positioning.

### HAZARD

### SAFE WORK GUIDELINES

#### ► Fuel System under Extreme Pressure

##### Details

The fuel system is pressurized, and the pressure can cause fuel to spray at the worker when the fuel line is removed.

##### Threat

Explosion

Injury or severe burns to exposed areas

- Wear eye goggles that are CSA-approved for the job
  - Have a Class B fire extinguisher nearby when working on a fuel system
  - Remove the filler cap to relieve the pressure
  - Follow the manufacturer's procedure for depressurizing the fuel system for the make and model of vehicle
- (Note:** Sometimes you must do this before you remove the battery)
- Since the fuel pump on most newer cars is located in the fuel tank, be careful to minimize leaks when disconnecting the gasoline line, which may be under pressure

#### ► Gasoline Liquid, Vapours and Fumes

##### Details

Gasoline vaporizes when it is exposed to the air (e.g., fuel spill, open container).

Benzene, a contaminant found in gasoline, and its vapours can cause damage to lung tissue over time, even cancer.

Incandescent light bulbs used in trouble lights can shatter when dropped or break if liquid is splashed on them. Such breakage can cause the filament to glow, leading to a fire if it is exposed to gasoline vapour.

Static electricity can cause fire or explosion when exposed to gasoline fumes.

##### Threat

Severe burns from fire or explosion

Dermatitis and removal of the fats and oils from the skin resulting in severely cracked,

**Note: Do not** use gasoline—alone or mixed with other liquids—to clean anything, including your hands

See *Regulation 851: Regulation for Industrial Establishments (Sections 63 and 78)*

##### Before You Start

- Make certain that your work area is well ventilated with a mechanical ventilation system delivering a continuous movement of air; if necessary, consult an occupational hygienist or a heating, ventilation and air conditioning (HVAC) technician to make sure that you have the proper exhaust system
- Eliminate all sources of ignition: smoking; static electricity; compressors; nearby welding, cutting or grinding operations; electric or gas hot water or hot air heaters; and any other devices or tools that can create electrical sparks
- Follow proper bonding and grounding procedures when transferring gasoline

### ▶ Gasoline Liquid, Vapours and Fumes *(continued)*

withered and wrinkled skin (known as de-fatting of the skin) with prolonged exposure

Cancer

Death

#### While You Are Working

- Store fuel drained from a gasoline tank only in a CSA-approved safety container or in a gasoline caddy—never in an open container
- If you siphon gasoline, use equipment that is recommended by suppliers for the purpose—not hoses, tubes or your mouth
- Use a double-insulated trouble light with a fluorescent bulb that has strong plastic cover or a Teflon-coated bulb instead of a common wire-cage style trouble light
- Wear rubber or nitrile gloves (see the material safety data sheet) for protection against splashes
- If you spill gasoline on your skin, wash immediately with soap and water
- Wipe up small gasoline spills immediately
- Clean up larger spills with absorbent material

### ▶ Brake, Transmission and Power Steering Fluids

#### Details

Some of these fluids may spill on the shop floor during drainage.

#### Threat

Slipping, falling, personal injury

Environmental contamination

- Capture brake fluids in a container
- Clean spills immediately using an absorbent material

### ▶ Sulphuric Acid

#### Details

Contained in the battery. Exposure can occur while handling a battery improperly.

#### Threat

Severe burns

Damage to and permanent scarring of the skin

Blindness

Lung damage through inhalation

- Make sure the battery is disconnected before removing the engine

### ▶ Freon

#### Details

Freon is a gas that produces very low temperatures and is hazardous to the environment.

#### Threat

Eye injuries and burns

Global warming

- Make sure the air conditioning system is disconnected before removing the engine

## ► Oil Spills and Splashes

### Details

Used oil can contain heavy metal contaminants that are harmful to your skin as well as to the environment.

### Threat

Personal injury from falls (slipping and tripping)

Eye injury from splashes

Dermatitis and other skin disorders, from prolonged exposure

Ground or water contamination

### Before You Start

- Use catch containers for used oil
- Transfer used oil into proper storage tanks
- Drain and recycle used oil filters
- Contract with a licensed waste hauler to remove, recycle or dispose of used oil

### While You Are Working

- Use safety glasses that are CSA-approved for the job to protect against oil splashes in your eyes
- Wash small spills on the engine with water before starting it
- For large leaks or spills, call the fire department so that they can take measures to contain them
- For relatively small spills, use an absorbent material to clean them up
- Use barrier cream and rubber, nitrile or other impervious gloves to protect your hands from oil

## ► Improper Use of Tools or Incorrect Procedures

### Details

Engines can fall if they are not secured properly.

### Threat

Being crushed

Serious injuries or death

- Use a hoist or A-frame and chain that are rated for the job
- Check the chain on the hoisting equipment before each use to make sure that it is in good repair and will hold the weight of the engine
- Make sure that the engine is properly secured before you remove the last bolt on the vehicle frame
- Wear steel-toed safety shoes, eye protection and other appropriate personal protective equipment that are CSA-approved for the job
- Use the correct tools for the job
- Make sure that you are working on a solid concrete or asphalt floor in good repair, not a dirt floor

## ► Noise

### Details

Noisy tools such as impact tools can be louder than 90 dB.

### Threat

Hearing damage, deafness

- Wear appropriate hearing protection and make sure that other workers near you are wearing hearing protection

## ► Falling or Moving Vehicle

### Details

Vehicles and parts that are not properly supported or attached can slip and fall or move.

### Threat

Serious injury or death

### Before You Start

- Wear CSA-approved safety shoes to protect your feet from falling objects
- Make sure that the vehicle is resting squarely on the lift
- Know the load limits of the lift and **do not** overload them
- If the hoist has a locking device, make sure it is in place when the lift is up

## ► Falling or Moving Vehicle (continued)

- **Do not** block or tie open the lift controls when the lift is in motion
- **Do not** leave the lift controls when the lift is in motion

### While You Are Working

- **Do not** lower the vehicle onto the jack stands; this disengages the lift's locking devices
- **Do not** lower the lift too far or too quickly; this can cause the jack stands to move, causing the vehicle to fall
- Use an impact wrench when working on an elevated vehicle
- **Do not** use a cheater or break bar when working on an elevated vehicle; the sudden pushing or pulling force could cause the vehicle to shift and fall

### Maintenance

- Take the lift out of service and lock it out until it is repaired if it is:
  - leaking (air or hydraulic)
  - dropping abruptly
  - dropping slowly
  - stepping when being raised or lowered
  - jerky when being raised or lowered

## ► Working in a Fixed or Awkward Position

### Details

Muscles tire quickly when you stay in a fixed or awkward position. That places them at higher risk for injury.

### Threat

Muscle strain and associated tendon, nerve, disc or joint pain. Common areas include low back, shoulder, elbow and wrist

### Before You Start

- Whenever possible, keep fit: stretch and exercise your body regularly outside of work
- Get help (e.g., another worker, support for the part) if your task cannot be done safely by one person
- Make sure you have enough room to move around easily and to store the engine after removal

### While You Are Working

- Keep parts, tools and supplies as close to you as possible
- Use height-adjustable controls on hoists and platforms to place vehicles and parts in the ideal work zone (e.g., if you're standing, between your shoulder and knuckle height)
- If possible, use 2 hands to support hand tools
- If you are standing in one place or in a confined space, use a foot rest, ideally at 6 to 10 inches off the ground (e.g., foot stool or tool box)
- Take frequent, short breaks:
  - for short jobs: 15 second break for every 1-2 minutes of work
  - for long jobs: 5 minute break every 15-20 minutes, working or resting in a different position

### After You Finish

- Change to a task that involves moving around or uses a different body part to improve your blood flow

