Welcome to the SAFE Online Refresher Course

Dealership personnel employed in the areas of **Service and Clean-Up/Porter** are required to take the following modules to satisfy the annual SAFE refresher requirements:

1. Back Safety
2. Fire Safety
3. General Dealership Safety
4. HAZCOM (Hazardous Communication)
5. Lock-out/Tag-out
6. Personal Protective Equipment (PPE)

This document contains the modules listed above. After reading through each of the modules in their entirety you will need to complete a short test which addresses the material covered in this manual.

Please note that the SAFE online refresher course is only available to those that have attended an instructor-led SAFE course at The Greater Cleveland Automobile Dealers' Association or at their dealership. Failure to adhere to these guidelines will render your refresher certification invalid.

Please contact Karen Ford at 440-746-1500 or via email at kford@gcada.org with any questions.

MODULE 1: BACK SAFETY

HOW TO PREVENT BACK INJURIES

The best way to prevent back injuries is to develop habits that reduce the strain placed on the back. There are some basic things you can do to help.

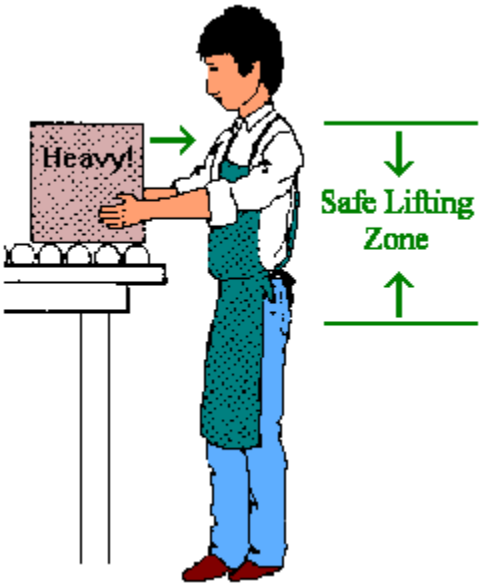
Avoid Lifting and Bending Whenever You Can

Anytime you can spare your back the stress and strain of lifting and bending, do so! If you don't use your back like a lever, you avoid putting it under so much potentially damaging force.

Place objects up off the floor. If you can set something down on a table or other elevated surface instead of on the floor, do it so you won't have to reach down to pick it up again.

Raise / lower shelves. The best zone for lifting is between your shoulders and your waist. Put heavier objects on shelves at waist level, lighter objects on lower or higher shelves.

Use a cart and/or dolly to move objects instead of carrying them yourself.



Q. Which is better for your back: Pushing a cart or pulling a cart?

A. *It is better to push a cart, dolly, lawnmower, wheelbarrow, etc. than it is to pull it. However, if you do have to pull it, consciously force yourself to tighten your stomach muscles and try to maintain good body posture.*

Use cranes, hoists, lift tables and other lift-assist devices whenever you can.

Use Proper Lifting Procedures

You can't always avoid lifting, but there are ways to reduce the amount of pressure placed on the back when you do so. By bending the knees, you keep your spine in a better alignment, and you essentially take away the lever principle forces. Instead of using your back like a crane, you allow your legs to do the work.

Follow these steps when lifting:

1. Take a balanced stance with your feet about a shoulder-width apart. One foot can be behind the object and the other next to it.

2. Squat down to lift the object, but keep your heels off the floor. Get as close to the object as you can.

3. Use your palms (not just your fingers) to get a secure grip on the load. Make sure you'll be able to maintain a hold on the object without switching your grip later.

4. Lift gradually (without jerking) using your leg, abdominal and buttock muscles and keeping the load as close to you as possible. Keep your chin tucked in so as to keep a relatively straight back and neck line.

5. Once you're standing, change directions by pointing your feet in the direction you want to go and turning your whole body. Avoid twisting at your waist while carrying a load.

6. When you put a load down, use these same guidelines in reverse.

Also follow these lifting tips:

- **Reduce the amount of weight lifted.** If you're moving a bunch of books, better to load several small boxes than one extremely heavy load.
- **Use handles and lifting straps.**
- **Get help** if the shape is too awkward or the object is too heavy for you to lift and move by yourself!

BODY MANAGEMENT

It's important to know your body's limitations, and it's important to be aware of your body position at all times. Learn to recognize those situations where your back is most a risk: bending, lifting, reaching, twisting, etc. Then take measures to avoid an injury.

Stretch first - If you know that you're going to be doing work that might be hard on your back, take the time to stretch your muscles before starting, just like a professional athlete would do before a workout. This will help you avoid painful strains and sprains.

Slow down - If you're doing a lot of heavy, repetitive lifting, take it slowly if you can. Allow yourself more recovery time between lifts, as well. Don't overdo it.

Rest your back - Take frequent, short (micro) breaks. Stretch. If you've ever been working in an awkward position for a long time, then stood up and felt stiff and sore, you know you've been in that position too long, and your body is now protesting. Taking a one minute stretch break every now and then can help you avoid that.

Sleep on a firm mattress. - Also, the best sleeping position for many people is either on the back with the knees slightly elevated (by a pillow), or on the side with knees slightly bent.

Get in shape - Strengthen your stomach muscles, lose a little weight, increase your flexibility.

Exercises for Preventing Back Pain *(Mayo Clinic)*

NOTE!
It is recommended you check with your physician before starting any exercise program, particularly if you have experienced a back injury or suffer from back pain.

MODULE 2: FIRE SAFETY

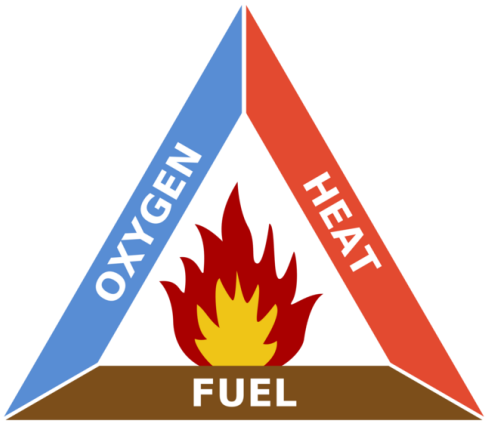
WHAT IS FIRE?

In order to have a **fire**, there must be three elements:

- **Fuel** -- something which will burn
- **Heat** -- enough to make the fuel burn
- **Oxygen** -- air

Usually these three elements are expressed as a triangle, called the **Fire Triangle**.

FIRE TRIANGLE



All three elements must be present at the same time to have a fire. Fire will burn until one or more of the elements is removed, and then will go out.

FIRE EXTINGUISHERS HAVE LIMITS

Portable extinguishers are not designed to fight large or spreading fires. Even against small fires, they are useful only under certain conditions.

- The operator must know how to use the extinguisher
- The extinguisher must be within easy reach, in working order, and fully charged
- The operator must have a clear escape route that will not be blocked by fire
- The extinguisher must match the type of fire being fought. (Extinguishers containing water are unsuitable for use on grease or electrical fires.)
- The extinguisher must be large enough to put out the fire. Many portable extinguishers discharge completely in as few as eight to ten seconds.

THE PROPER FIRE EXTINGUISHER

Select only fire extinguishers that have been tested by an independent laboratory and labeled for the type and size of fire they can extinguish. Use the labels below as a guide to purchase the kind of extinguisher that suits your needs.

CLASSES OF FIRES

There are four classes of fires. All fire extinguishers are labeled, using standard symbols, for the classes of fires on which they can be used. A red slash through any of the symbols tells you the extinguisher cannot be used on that class of fire. A missing symbol tells you only that the extinguisher has not been tested for a given class of fire, but may be used if an extinguisher labeled for that class of fire is not available.

Class A: Ordinary combustibles such as wood, cloth, and paper

Class B: Flammable liquids such as gasoline, oil, and oil-based paint

Class C: Energized electrical equipment, including wiring, fuse boxes, circuit breakers, machinery and appliances

Class D: Combustible metals such as magnesium or sodium

Remember that the extinguisher must be appropriate for the type of fire being fought. Multipurpose fire extinguishers, labeled ABC, may be used on all three classes of fire. If you use the wrong type of extinguisher, you can endanger yourself and make the fire worse. It is also very dangerous to use water or an extinguisher labeled only for Class A fires on a cooking-grease or electrical fire.

FIRE EXTINGUISHER SIZES

Portable extinguishers are also rated for the size of fire they can handle. This rating is expressed as a number from 1 to 40 for Class A fires and from 1 to 640 for Class B fires. This rating will appear on the label – 2A:10B:C, for example. The larger the numbers, the larger the fire of a specific class on which the extinguisher can be used (but higher-rated models are often heavier – make sure you can hold and operate an extinguisher before you buy it). No number accompanies an extinguisher's Class C rating. The C on the label indicates only that the extinguisher is safe to use on electrical fires.

Extinguishers for Class D fires must match the type of metal that is burning. These extinguishers do not use numerical ratings. Extinguishers for Class D fires are labeled with a list detailing the metals that match the unit's extinguishing agent.

TYPES OF FIRE EXTINGUISHERS

Depending on their intended use, portable extinguishers store specific "extinguishing agents," which are expelled onto the fire.

- **Pressurized water models** are appropriate for use on Class A fires only. These must never be used on electrical or flammable-liquid fires.
- **Carbon dioxide** extinguishers contain pressurized liquid carbon dioxide, which turns to a gas when expelled. These models are rated for use on Class B and C fires, but can be used on a Class A fire. Carbon dioxide does not leave a residue.
- **Dry-chemical extinguishers** are either stored-pressure models or cartridge-operated models. The stored-pressure models have a lever above the handle for operation. The cartridge-operated models require two steps: Depress the cartridge lever, and then squeeze the nozzle at the end of the hose. The dry chemicals leave a residue that must be cleaned up after use.

REMEMBER THE PASS-WORD

Keep your back to an unobstructed exit and stand six to eight feet away from the fire.

Follow the four-step procedure:

Pull, Aim, Squeeze, and Sweep

PULL the pin: This unlocks the operating lever and allows you to discharge the extinguisher. Some extinguishers may have other lever-release mechanisms.

AIM low: Point the extinguisher nozzle (or hose) at the base of the fire.

SQUEEZE the lever above the handle: This discharges the extinguishing agent. Releasing the lever will stop the discharge. (Some extinguishers have a button instead of a lever.)

SWEEP from side to side: Moving carefully toward the fire, keep the extinguisher aimed at the base of the fire and sweep back and forth until the flames appear to be out. Watch the fire area. If the fire re-ignites, repeat the process.

SHOULD YOU FIGHT THE FIRE?

BEFORE you consider fighting a fire…

- Call the Fire Department (**Dial 911**).
- Make sure the building is being evacuated.
- Determine whether the fire is small and is not spreading.
- Confirm you have a safe path to an exit not threatened by the fire.
- Know how to use a fire extinguisher.

NEVER fight a fire if *even one* of the following is true:

- The fire is spreading beyond the immediate area in which it started or is already a large fire.
- The fire could block your escape route.
- You are unsure of the proper operation of the extinguisher.
- You doubt that the extinguisher you are holding is designed for the type of fire at hand or is large enough to fight the fire.

SAFETY CAN

An approved safety can is one of the best fire prevention items you can buy. This can has a spark arrestor in the spout and allows vapor to escape, reducing pressure build-up and preventing liquid from spilling if the can were tipped over.

MODULE 3: GENERAL DEALERSHIP SAFETY

Everyone who works in a dealership plays a role in preventing injuries. It is vital to the dealership and the business to give great customer service, repair a customer's car correctly and work safely. Injuries do not happen by fate or chance but have definite causes, and these causes have to be identified and fixed. All employees in the organization must think and react to safety issues, including technicians, salespersons, office workers and detail persons. Injuries can happen to anyone in the dealership and when you see something that could lead to a problem it should be corrected as soon as possible.

Safety policies and rules have been established in all dealerships and below are some of these policies. Please check with your SAFE supervisor for the exact policies for your dealership.

- Wear the required personal protective equipment at all times.
- Housekeeping practices are important for safety and overall health in a dealership. Maintaining a clean work area and cleaning up spills and debris quickly will help in the overall safety of the dealership as well as the working conditions.
- Maintain guards on machines at all times.
- Never work on equipment or machinery that could move as a result of energy that was not locked out.
- When lifting any object, never bend at the waist. Keep the back flat, stand close to the load, bend at the knees and lift the load close to the body. Move your feet when shifting the load to move it, do not twist or rotate the body.
- Horseplay is forbidden. Do not disturb or interfere employees when they are performing their jobs.
- Observe all signs, warning tags and labels.
- Do not smoke near flammables or any combustible materials. Many dealerships have specific smoking locations and smoking is allowed in those locations only.
- Know where fire extinguishers are located.
- Secure compressed gas cylinders in the upright position with the caps securely in place.
- Safely barricade and identify floor openings or other obstructions, which could cause trips and falls.
- Wear seat belts when operating any motorized vehicle.
- Only people who have been trained to operate equipment such as forklifts can operate such equipment.

- Dispose of hazardous materials properly.
- Use safety cans for flammables such as gasoline and other liquids.
- Correct unsafe working conditions wherever possible and report these to your SAFE supervisor.
- Before working with a hoist, ensure that it is safe and secure.
- Never use an air hose to blow dust off of your clothing.
- Use an approved wet wash procedure or other method to remove brake dust from brake drums.
- Clamp or secure materials when drilling, grinding or operating any machine that rotates.
- Stack and store products neatly and safely. Keep parts clear of aisle ways and away from your feet when working.
- Report all injuries to your management and your SAFE supervisor.
- Do not allow anyone to ride lifts or be in the vehicle when raising or lowering lift.
- Never overload your lift.
- Make sure lift locking devices are locked on lifts before starting work on car.
- All employees who work with chemicals should be trained.
- Approved ladders or stepladders should be used when you are placing/retrieving items in high places.
- Electrical cords should be used for temporary work only; machines and other permanent items cannot be powered by electrical cords.
- All plugs should be a three-prong grounded plug when used in the dealership.

MODULE 4: HAZCOM (HAZARDOUS COMMUNICATION)

DEFINITIONS

Highly toxic materials	Toxic materials	LD50
Irritant	Sensitizer	Asphyxiant
Anesthetics	Hepatotoxic agents	Nephrotoxic agents
Blood damaging agents	Vapor density	Flammable limits
Flammable range	Flashpoint	Corrosive materials
PEL	TWA	STEL
Ceiling	IDLH	TLV-TWA

Highly toxic materials have LD50 of less than 200 parts per million. Examples of some of these chemicals are nitrogen dioxide, nicotine and arsine.

Toxic materials have LD50 that are greater than 200 parts per million and some examples of these are chlorine phosgene and phenol.

LD50 means 50% of the test subjects die at this level. This is usually done with white rats and could be other laboratory animals that are exposed to the test chemical. At the point that half of the animals die this is what is considered the LD50. This number is on safety data sheets and gives an idea of how toxic the chemical is.

Irritant is any chemical that can cause inflammation of the mucous membrane of the respiratory tract.

Sensitizer is any chemical that causes an allergic reaction in normal tissue after repeated exposure.

Asphyxiant is any inert element that in sufficient quantity will exclude oxygen from the body.

Anesthetics are any chemicals which act to depress the central nervous system.

Hepatotoxic agents are any chemicals that damage the normal functioning of the liver.

Nephrotoxic agents are any chemicals that damage the normal functioning of the kidneys.

Blood damaging agents are any chemical that breaks down the red blood cells or chemically affect the hemoglobin in the blood.

Vapor density is defined as the relative weight of a gas or vapor compared to air, which has an arbitrary value of one. If a gas has a vapor density of less than one it will generally rise in air. If the vapor density is greater than one the gas will generally sink in air.

Flammable (explosive) limits refer to the conditions under which a mixture of a flammable material and air may catch fire or explode. For gases or vapors, which form flammable mixtures with air or oxygen, there is a minimum concentration of vapor in air or oxygen below which propagation of flame does not occur on contact with a source of ignition. There is also a maximum proportion of vapor or gas in air above which propagation of flame does not occur. These boundary-line mixtures of vapor or gas with air, which if ignited will just propagate flame,

are known as the "lower and upper flammable limits" (LFL and UFL) or the "lower and upper explosive limits" (LEL and UEL), and are usually expressed in terms of percentage by volume of gas or vapor in air. LEL and LFL are different terms for the same concept and can be used interchangeably. In popular terms, a mixture below the lower flammable limit is too "lean" to burn or explode and a mixture above the upper flammable limit too "rich" to burn or explode.

Flammable (explosive) range. The range of flammable vapor or gas-air mixture between the upper and lower flammable limits is known as the "flammable range", also often referred to as the "explosive range". For example, the lower limit of flammability of acrylonitrile at ordinary ambient temperatures is approximately 3 percent vapor in air by volume, while the upper limit of flammability is about 17 percent. All concentrations by volume of gasoline vapor in air falling between 1.7 percent and 7.4 percent are in the flammable or explosive range.

Flashpoint is the minimum temperature at which a liquid gives off a sufficient vapor to reach 100% LEL (sufficient vapor to form an ignitable mixture with the air near the surface of the liquid).

Corrosive materials are materials that have a pH of over 12.5 or less than 2.0. These materials will burn the skin and also corrode metals. The pH of a material that is neutral is 7.0; anything less 7.0 is an acid and anything over 7.0 is a base, caustic, or alkaline.

PEL stands for ***permissible exposure limit*** and is the OSHA regulation for a how much a person can be exposed to a material. The PEL is an 8-hour time frame and will be stated in parts per million (PPM) or milligrams per cubic meter (mg/m^3).

TWA stands for ***time weighted average.*** The PEL is a time weighted average and an example would be 50 PPM for an 8-hour period of time.

STEL stands for ***short-term exposure limit*** and is a 15-minute period of time with no more than 4 exposures in an 8-hour period of time.

Ceiling is short for ceiling limit and is the highest amount that a person can be exposed to at any time.

IDLH stands for ***immediately dangerous*** to your ***life*** and ***health***. No one should ever be exposed to this amount without proper personal protective equipment.

TLV-TWA (Threshold limit value time-weighted average) is the time-weighted average concentration of a substance for a normal 8-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day.

CARBON MONOXIDE

Concentration of CO in air	Inhalation time and toxic developed
50 parts per million (ppm)	Safety level as specified by the Health and Safety Executive
200 PPM	Slight headache within 2-3 hours
400 PPM	Frontal headache within 1-2 hours, becoming widespread in 3 hours
800 PPM	Dizziness, nausea, convulsions within 45 minutes, insensible in 2 hours

Carbon Monoxide poisons by entering the lungs via the normal breathing mechanism and displacing oxygen from the bloodstream. Interruption of the normal supply of oxygen puts at risk the functions of the heart, brain and other vital functions of the body.

The above information is for a healthy adult. Persons suffering from heart or respiratory health problems, infants and small children, unborn children, expectant mothers and pets can be affected by CO poisoning more quickly than others in the household and may be the first to show symptoms.

What Are the Health Effects?

Carbon monoxide interferes with the distribution of oxygen in the blood to the rest of the body. Depending on the amount inhaled, this gas can impede coordination, worsen cardiovascular conditions, and produce fatigue, headache, weakness, confusion, disorientation, nausea, and dizziness. Very high levels can cause death.

The symptoms are sometimes confused with the flu or food poisoning. Fetuses, infants, elderly, and people with heart and respiratory illnesses are particularly at high risk for the adverse health effects of carbon monoxide.

An estimated 1,000 people die each year as a result of carbon monoxide poisoning and thousands of others end up in hospital emergency rooms.

Mechanics are exposed to a wide variety of toxic chemicals. Exposure to high levels of those chemicals over a period of time can cause damage to health. Cigarette smoking greatly increases the hazard.

Some of the elements contained in cigarette smoke and the various chemicals found in auto repair work may attack different parts of the respiratory system at the same time.

Carbon monoxide from car exhaust and cigarette smoke is an odorless, colorless gas that reduces the oxygen-carrying capacity of the blood. Its effects are first felt in those tissues most sensitive to a lack of oxygen, such as the brain and the heart.

Early symptoms of carbon monoxide poisoning include headache, followed by weakness, dizziness, dim vision, nausea, and vomiting. At high concentrations, coma and death may result.

Too much carbon monoxide in your blood will kill you. Most of us know to try to avoid this. Less well-known is the fact that low-level exposure to this gas also endangers your health.

One of the imperfections of our human bodies is that, given a choice between carbon monoxide and oxygen, the protein hemoglobin in our blood will always latch on to carbon monoxide and ignore the life-giving oxygen. Because of this natural chemical affinity, our bodies – in effect – replace oxygen with carbon monoxide in our bloodstream, causing various levels of cell suffocation depending on the intensity and duration of exposure.

ACETYLENE

Pure acetylene is a colorless gas with a pleasant odor; as prepared from calcium carbide it usually contains traces of phosphate that cause an unpleasant, garlic-like odor. Acetylene can be decomposed to its elements with the liberation of heat. The decomposition may or may not give rise to explosions, depending on conditions. Pure acetylene under pressure in excess of about 15 pounds per square inch or in liquid or solid form explodes with extreme violence.

Mixtures of air and acetylene are explosive over a wide range, from 2.5 percent acetylene in air to 99 percent acetylene in air. When burned with the correct amount of air, acetylene gives a pure, white light, and for this reason it was at one time used for illumination in locations where electric power was not available (e.g., buoys, miners' lamps, and road signals). The combustion of acetylene produces a large amount of heat, and, in a properly designed torch, the oxyacetylene flame attains the highest flame temperature (about 6,000°F, or 3,300°C) of any known mixture of combustible gases.

COMPRESSED GASES

Compressed gas cylinders are used in many workplaces to store gases that vary from extremely flammable (acetylene) to extremely inert (helium). Many of these cylinders store gases at extremely high pressures that can turn a damaged cylinder in a torpedo capable of going through multiple concrete block walls. Other cylinders store the contents as a liquid (example: acetylene) and have special orientation requirements. If handled properly compressed gas cylinders are safe. If handled improperly, the same cylinders can present a severe hazard to you and your employees.

Compressed gas cylinders shall be kept away from excessive heat, shall not be stored where they might be damaged or knocked over by passing or falling objects, and shall be stored at least 20 feet (6.1 meters) away from highly combustible materials.

Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 feet (6.1 meters) from highly combustible materials such as oil or sawdust. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

Most modern cylinders either come with a valve cap or built-in valve protection. An example of valve protection is the collar on propane tanks. Valve caps must be on all cylinders at all times except when the cylinder is in use. If the cylinder was not designed to have a valve cap, the cylinder is not required to be capped. The actual OSHA standard (1910.253(b)(2)(iv)) says:

"Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use."

OXYGEN

Composition of Oxygen

Our atmosphere contains 21% oxygen. The remaining atmosphere consists of 78% nitrogen and 1% traces of other gases. Oxygen under normal conditions is an odorless, colorless, tasteless, non-combustible gas. It is the most important single element on earth.

At each breath we fill our lungs with air. Millions of tiny air sacs (known as "alveoli") in our lungs inflate like tiny balloons. In the minutely thin walls enclosing each sac are microscopic capillaries though which blood is constantly transported, from the lungs to every cell in the body. The oxygen extracted from the air in the lungs is carried by the blood to every part of the body. Because the body has no way to store oxygen over a long period of time, it leads a breath-to-breath existence.

The human body must have oxygen to convert fuel (the carbohydrates, fats, and proteins in our diet) into heat, energy, and life. The conversion of body fuels into life is similar to the process of combustion; fuel and oxygen is consumed, while heat and energy is generated. This process is known as "metabolism".

Also of interest, we have been told by the suppliers of welding oxygen, the purity level required for welding and cutting purposes is more critical than for breathing.

Although oxygen is non-flammable, materials which burn in air will burn much more vigorously, and at a higher temperature, in oxygen. If ignited, some combustibles such as oil burn in oxygen with explosive violence. Some other materials which do not burn in air will burn vigorously in oxygen-enriched atmospheres.

A hazardous condition does exist if high-pressure oxygen equipment becomes contaminated with hydrocarbons such as oil, grease, or other combustible materials, which may include oil from the operator's hands or contaminated tools.

Oxygen under pressure presents a hazard in the form of stored energy.

Rapid release of high-pressure oxygen through orifices, needle valves, etc. in the presence of foreign particles can cause friction or impact resulting in temperatures which may be sufficient to ignite combustible materials and rapidly oxidize metals.

A cylinder will heat as it is filled from a high-pressure source, due to the heat of compression generated as gas is forced into the cylinder. The more rapidly the cylinder is filled, the higher temperature rise in the cylinder. Excessive temperature may result in ignition of any combustible materials that are present.

Storing

Compressed gas containers should not be subjected to atmospheric temperatures above 130°F. A flame shall never be permitted to come in contact with any part of a compressed gas container. Containers shall not be stored near readily ignitable substances such as gasoline or waste papers, or near combustibles including oil. Containers shall not be exposed to continuous dampness nor be stored in the sun.

Putting in Service

Container valves should be opened slowly for safety. Valve outlets should be pointed away from yourself and other persons. Valve wheels or levers should not be hammered in an attempt to open or close the valve. For valves that are hard to open, or frozen because of corrosion, the supplier should be contacted for instructions. Before a regulator is removed from a container, the container valve should be closed and the regulator drained of gas pressure. Oxygen containers, valves, regulators, hoses and other oxygen apparatus should be kept free from oil or grease and shall not be handled with oily hands, oily gloves or with greasy equipment.

Labeling

The information on all labels should correspond to the information on the appropriate Safety Data Sheet. All containers must be labeled. Also, piping that carries hazardous chemicals must be labeled (example — hot water, compressed gases, high pressure water, or high pressure air). Transfer containers are temporary containers that are used by one person for one shift only. They are not required to be labeled. According to the U.S. Department of Labor General Industry Digest, 1994 (Revised):

"The employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with the identity of the hazardous chemical(s) contained therein and must show hazard warnings appropriate for employee protection."

SAFETY DATA SHEETS

As an employer you should have a Safety Data Sheet (SDS) for every chemical that your employees use or are potentially exposed to. The actual OSHA standard, 1910.1200(g)(8) says:

"The employer shall maintain in the workplace copies of the required safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

HOW TO READ A SAFETY DATA SHEET (SDS)

At first glance, most safety data sheets are confusing. However, by knowing what's in each section you can find the information that you are looking for quickly. Some sections such as Hazardous Ingredients, Transportation Information and Regulatory Information will be used mainly by the Safety Director.

OSHA requires all employees to be familiar with the hazards and precautions of the chemicals that they are working with. As an employee, this is your responsibility. Monthly safety meetings will help you to review and reinforce this information. You should not use a chemical that you don't have an SDS for. All chemicals in use should be on the Hazardous Chemical inventory for your area. Employees should review the format and features of the SDS outlined below and familiarize themselves immediately.

The new Global Harmonization Standard (discussed below) requires that the information on the SDS is presented using consistent headings in a specified sequence. Each Safety Data Sheet is divided into approximately sixteen sections, and should include the following:

The format of the 16-section SDS should include the following sections:

Section 1. Identification
Section 2. Hazard(s) identification
Section 3. Composition/information on ingredients
Section 4. First-Aid measures
Section 5. Fire-fighting measures
Section 6. Accidental release measures
Section 7. Handling and storage
Section 8. Exposure controls/personal protection
Section 9. Physical and chemical properties
Section 10. Stability and reactivity
Section 11. Toxicological information
Section 12. Ecological information
Section 13. Disposal considerations
Section 14. Transport information
Section 15. Regulatory information
Section 16. Other information, including date of preparation or last revision

Sections 12-15 may be included in the SDS, but are not required by OSHA.

GLOBAL HARMONIZATION STANDARD UPDATES

Under the Global Harmonization Standard (GHS), all labels will require the following elements:

- **Pictogram:** a symbol plus other graphic elements, such as a border, background pattern, or color that is intended to convey specific information about the hazards of a chemical. Each pictogram consists of a different symbol on a white background within a red square frame set on a point (i.e. a red diamond). There are nine pictograms under the GHS.
- **Signal words:** a single word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for less severe hazards.
- **Hazard Statement:** a statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.
- **Precautionary Statement:** a phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling of a hazardous chemical. Employees should review the precautionary statement on all safety data sheets or labels and ensure the proper precautions are taken when storing or handling chemicals.

**Please note- Safety Data Sheets using the GHS format outlined herein are currently being phased in, and after December 1, 2015 all SDS's will be in this format.*

GHS PICTOGRAMS

There are nine pictograms under the GHS to convey the health, physical and environmental hazards. The final Hazard Communication Standard (HCS) requires eight of these pictograms, the exception being the environmental pictogram, as environmental hazards are not within OSHA's jurisdiction. The hazard pictograms and their corresponding hazards are shown below.

HCS Pictograms and Hazards

Health Hazard 	**Flame** 	**Exclamation Mark** 
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non Mandatory)
Gas Cylinder	**Corrosion**	**Exploding Bomb**

		
• Gases under Pressure	• Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	• Explosives • Self-Reactives • Organic Peroxides
Flame over Circle 	**Environment (Non Mandatory)** 	**Skull and Crossbones** 
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)

Employers may choose to label workplace containers either with the same label that would be on shipped containers for the chemical under GHS. Alternative labeling systems such as the National Fire Protection Association (NFPA) 704 Hazard Rating and the Hazardous Material Information System (HMIS) are permitted for workplace containers. However, the information supplied on these labels must be consistent with the revised HCS, e.g., no conflicting hazard warnings or pictograms.

NFPA HAZARD IDENTIFICATION SYSTEM

HEALTH HAZARD (Blue)

Type of Possible Injury

A discussion of health hazards and the terminology used to describe them is given in Appendix A of the OSHA Hazard Communication Standard (29 CFR 1910.1200 App A).

0	Material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.	Example: peanut oil
1	Material that on exposure would cause irritation but only minor residual injury.	Example: turpentine
2	Material that on intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Example: ammonia gas
3	Material that on short exposure could cause serious temporary or residual injury.	Example: chlorine gas
4	Material that on very short exposure could cause death or major residual injury.	Example: hydrogen cyanide

FLAMMABILITY (Red)

Susceptibility of Material to Burning

A note about the word ***inflammable***:

Inflammable means the material **will** burn. Think of "inflammation" – if you have an inflamed wound, it is red and hot to the touch. As recently as about 15 years ago, trucks and containers were marked "inflammable" if they contained material that could burn (material that won't burn is called non-inflammable). The problem was that many people assumed inflammable meant that a material would *not* burn – a potentially deadly mistake. Today, the word "flammable" has replaced "inflammable" almost entirely, but don't be confused if you encounter the older term.

0	Material will not burn.	Example: water
1	Material must be pre-heated before ignition can occur.	Example: corn oil
2	Material must be moderately heated or exposed to relatively high ambient temperature before ignition can occur.	Example: diesel fuel, oil
3	Liquids and solids that can be ignited under almost all ambient temperature conditions.	Example: gasoline
4	Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or that are readily dispersed in air and that will burn readily.	Example: propane gas

REACTIVITY; STABILITY (Yellow)

Capacity of a Material to Undergo a Chemical Reaction

0	Material that in itself is normally stable, even under fire exposure conditions, and is not reactive with water.	Example: liquid nitrogen
1	Material that in itself is normally stable, but which can become unstable at elevated temperatures and pressures.	Example: phosphorus (red or white)
2	Material that readily undergoes violent chemical change at elevated temperatures and pressures or which reacts violently with water or which may form explosive mixtures with water.	Example: calcium metal
3	Material that in itself is capable of detonation or explosive decomposition or reaction but requires a strong initiating source or which must be heated under confinement before initiation or which reacts explosively with water.	Example: fluorine gas
4	Material that in itself is readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.	Example: trinitrotoluene (TNT)

SYMBOLS SPECIFIED IN NATIONAL FIRE CODES, SECTION 704		
W	Material shows unusual reactivity with water (i.e. don't put water on it).	Example: magnesium metal
OX	Material possesses oxidizing properties.	Example: ammonium nitrate (fertilizer used in Oklahoma City bomb)

OTHER SYMBOLS COMMONLY USED	
ACID	Material is an acid.
ALK	Material is a base (alkaline).
COR	Material is corrosive.
	Material is radioactive.

MODULE 5: LOCK-OUT TAG-OUT

Many serious accidents have happened when someone thought a machine or the power to it was safely off. "Lock-out tag-out" is a way to protect yourself and others by ensuring that machines remain completely, temporarily off. Without a lock-out tag-out system there is the possibility that a machine will unexpectedly start up, either because of stored energy, which was not correctly released, or through the actions of someone starting the process without realizing that it isn't safe to do so.

The lock-out tag-out standard requires that hazardous energy sources be "isolated and rendered inoperative" before maintenance or servicing work can begin. These energy sources include electrical (either active current or stored as in a capacitor), pneumatic, hydraulic, mechanical, thermal, chemical, and the force of gravity. It is important to remember **all** of the energy sources must be "isolated and rendered inoperative." Overlooking an energy source has proved fatal on several occasions.

OSHA requires three basic elements in a lock-out tag-out program. These are training, written procedures, and inspections. Training is required for two types of people: "authorized employees" and "affected employees." Authorized employees are people who do the maintenance or servicing work. They are the people who actually perform the lock-out tag-out. Affected employees are people who may be affected by or work near equipment that is locked or tagged out. Affected employees are not permitted to perform servicing or maintenance work that requires a lock-out or tag-out.

Written procedures detailing the lock-out tag-out procedure are required for equipment having two or more energy sources. Written procedures communicate important information to persons performing lock-out tag-out. They identify energy sources and provide step-by-step instruction for locking or tagging out energy sources, releasing stored energy, and verifying the equipment cannot be re-started after lockout is applied. Group lock-out tag-out procedures must also be clearly documented. Procedures must be kept up-to-date, and changes must be communicated to everyone who may possibly be affected by them. They are only useful if all the information they contain is correct.

SEVEN BASIC STEPS FOR LOCK-OUT TAG-OUT

1. **Think, plan and check.**

   - If you are in charge, think through the entire procedure.
   - Identify all parts of any systems that need to be shut down.
   - Determine what switches, equipment and people will be involved.
   - Carefully plan how restarting will take place.

2. **Communicate.**

   - Notify all those who need to know that a lock-out tag-out procedure is taking place.
   - Identify all appropriate power sources, whether near or far from the job site.
   - Include electrical circuits, hydraulic and pneumatic systems, spring energy and gravity systems.

3. **Neutralize all appropriate power at the source.**

    - Disconnect electricity.
    - Block movable parts.
    - Release or block spring energy.
    - Drain or bleed hydraulic and pneumatic lines.
    - Lower suspended parts to rest positions.

4. **Lock out all power sources.**

    - Use a lock designed only for this purpose.
    - Each worker should have a personal lock.

5. **Tag out all power sources and machines.**

    - Tag machine controls, pressure lines, starter switches and suspended parts.
    - Tags should include your name, department, how to reach you, the date and time of tagging and the reason for the lockout.

6. **Do a complete test.**

    - Double check all the steps above.
    - Do a personal check.
    - Push start buttons, test circuits and operate valves to test the system.

7. **When It's Time To Restart…**

    - After the job is completed, follow the safety procedures you have set up for restart, removing only your own locks and tags. With all workers safe and equipment ready, it's time to turn on the power.

These procedures should be followed when you are working on any equipment in the dealership, including but limited to lifts, compressors, and electrical systems in the building.

REMOTE STARTS DISCUSSION

The following questions were taken from an advertisement regarding remote starts, and illustrate a few ways these features can cause problems for you.

DO YOU HAVE A TEMPERATURE-CONTROLLED REMOTE START SYSTEM FOR EXTREME COLD CONDITIONS?

Crimestopper manufactures a special “Cool Timer” Temperature and Timer interface to be used with Crimestopper remote start systems. The RS400 Cool Timer allows you to select from four different low-temp thresholds. Once the temp reaches this low level your vehicle will automatically start to prevent fluid freeze-up. The same Cool Timer module also allows you to select four different hourly intervals to activate a remote start at specific hourly time intervals.

HOW FAR AWAY CAN I START MY ENGINE?

Crimestopper remote start systems include an Extended-Range (ER) on-glass antenna system. These window-mount antenna systems will allow you to start your vehicle from up to 500-1000 ft. away. There are new FM models now available that incorporate special High-Frequency 2-way Paging. FM systems cost slightly more, but offer the luxury of greater range and 2-way paging. With FM 2-Way paging, the remote control is also a pager that receives signals from the vehicle for remote start confirmation. There is not more guessing whether or not your vehicle has started when using these new systems.

WHAT ABOUT AUTOMATIC OR MANUAL STYLE TRANSMISSIONS?

Currently Crimestopper manufactures remote start systems for automatic transmissions only. This is to guarantee 100% safe and reliable operation.

MODULE 6: PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE PROTECTION IN THE WORKPLACE

Every day an estimated 1,000 eye injuries occur in American workplaces. The financial cost of these injuries is enormous – more than $300 million per year in lost production time, medical expenses, and workers compensation. No dollar figure can adequately reflect the personal toll these accidents take on the injured workers.

Take a moment to think about possible eye hazards at your workplace. A 1980 survey by the Labor Department's Bureau of Labor Statistics (BLS) of about 1,000 minor eye injuries reveals how and why many on-the-job accidents occur.

WHAT CONTRIBUTES TO EYE INJURIES AT WORK?

Not wearing eye protection. BLS reports that nearly three out of every five workers injured were not wearing eye protection at the time of the accident.

Wearing the wrong kind of eye protection for the job. About 40% of the injured workers were wearing some form of eye protection when the accident occurred. These workers were most likely to be wearing protective eyeglasses with no side shields, though injuries among employees wearing full-cup or flat-fold side shields occurred, as well.

WHAT CAUSES EYE INJURIES?

Flying particles. BLS found that almost 70% of the accidents studied resulted from flying or falling objects or sparks striking the eye. Injured workers estimated that nearly three-fifths of the objects were smaller than a pin head. Most of the particles were said to be traveling faster than a hand-thrown object when the accident occurred.

Contact with chemicals caused one-fifth of the injuries. Other accidents were caused by objects swinging from a fixed or attached position, like tree limbs, ropes, chains, or tools which were pulled into the eye while the worker was using them.

WHERE DO ACCIDENTS OCCUR MOST OFTEN?

Craft work; industrial equipment operation. Potential eye hazards can be found in nearly every industry, but BLS reported that more than 40% of injuries occurred among craft workers, like mechanics, repairers, carpenters, and plumbers. Over a third of the injured workers were operatives, such as assemblers, sanders, and grinding machine operators. Laborers suffered about one-fifth of the eye injuries. Almost half the injured workers were employed in manufacturing; slightly more than 20% were in construction.

HOW CAN EYE INJURIES BE PREVENTED?

Always wear effective eye protection. OSHA standards require that employers provide workers with suitable eye protection. To be effective, the eyewear must be of the appropriate type for the hazard encountered and properly fitted. For example, the BLS survey showed that 94% of the injuries to workers wearing eye protection resulted from objects or chemicals going around or under the protector. Eye protective devices should allow for air to circulate between the eye and the lens. Only 13 workers injured while wearing eye protection reported breakage.

Nearly one-fifth of the injured workers with eye protection wore face shields or welding helmets. However, only six percent of the workers injured while wearing eye protection wore goggles, which generally offer better protection for the eyes. Best protection is afforded when goggles are worn with face shields.

EYE PROTECTION WORKS!

BLS reported that more than 50% of workers injured while wearing eye protection thought the eyewear had minimized their injuries. But nearly half the workers also felt that another type of protection could have better prevented or reduced the injuries they suffered.

It is estimated that 90% of eye injuries can be prevented through the use of proper protective eyewear. That is our goal and, by working together, OSHA, employers, workers, and health organizations can make it happen.

Prevention of eye injuries requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, contractors, or others passing through an identified eye hazard area. To provide protection for these personnel, Supervisors of such areas shall procure a sufficient quantity of goggles and/or plastic eye protectors which afford the maximum amount of protection possible. If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

- Suitable protectors shall be used when employees are exposed to hazards from flying particles, molten metal, acids or caustic liquids, chemical liquids, gases, or vapors, or potentially injurious light radiation.
- Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment.
- Side protectors shall be used when there is a hazard from flying objects.
- Goggles and face shields shall be used when there is a hazard from chemical splash.
- Face shields shall only be worn over primary eye protection (safety glasses or goggles).
- For employees who wear prescription lenses, eye protectors shall either incorporate the prescription in the design or fit properly over the prescription lenses.
- Protectors shall be marked to identify the manufacturer.
- Equipment fitted with appropriate filter lenses shall be used to protect against light radiation. Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

EMERGENCY EYEWASH FACILITIES

Emergency eyewash facilities meeting the requirements of ANSI Z358.1 will be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities will be located where they are easily accessible in an emergency.

EYE AND FACE PROTECTION SELECTION CHART

Source	Assessment of Hazard	Protection
IMPACT – Chipping, grinding, machining, drilling, chiseling, riveting, sanding, etc.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles with side protection, goggles, face shields. For severe exposure, use face shield over primary eye protection.
CHEMICALS – Acid and chemicals handling	Splash	Goggles, eyecup and cover types. For severe exposure, use face shield over primary eye protection.
	Irritating mists	Special-purpose goggles
DUST – Woodworking, buffing, general dusty conditions	Nuisance dust	Goggles, eyecup and cover types.
LIGHT and/or RADIATION		
Welding - electric arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14
Welding – gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4
Cutting, torch brazing, torch soldering	Optical radiation	Spectacles or welding face shield. Typical shades: 1.5-3
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable.

HAND PROTECTION

Suitable gloves shall be worn when hazards from chemicals, cuts, lacerations, abrasions, punctures, burns, biologicals, and harmful temperature extremes are present. Glove selection shall be based on performance characteristics of the gloves, conditions, durations of use, and hazards present. One type of glove will not work in all situations.

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and Safety Data Sheets before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or any combination thereof.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The types of glove materials to be used in these situations include leather, welder's gloves, aluminum-backed gloves, and other types of insulated glove materials.

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.
- Always lock-out machines or tools and disconnect the power before making repairs.
- Treat a machine without a guard as inoperative; and
- Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

The following is a guide to the most common types of protective work gloves and the types of hazards they can guard against:

a. **Disposable Gloves**. Disposable gloves, usually made of light-weight plastic, can help guard against mild irritants.
b. **Fabric Gloves**. Made of cotton or fabric blends, are generally used to improve grip when handling slippery objects. They also help insulate hands from mild heat or cold.
c. **Leather Gloves**. These gloves are used to guard against injuries from sparks or scraping against rough surfaces. They are also used in combination with an insulated liner when working with electricity.

d. **Metal Mesh Gloves**. These gloves are used to protect hands form accidental cuts and scratches. They are used most commonly by persons working with cutting tools or other sharp instruments.
e. **Aluminized Gloves**. Gloves made of aluminized fabric are designed to insulate hands from intense heat. These gloves are most commonly used by persons working with molten materials.
f. **Chemical Resistance Gloves**. These gloves may be made of rubber, neoprene, polyvinyl alcohol or vinyl, etc. The gloves protect hands from corrosives, oils, and solvents. The following table is provided as a guide to the different types of glove materials and the chemicals they can be used against. When selecting chemical resistance gloves, be sure to consult the manufacturer's recommendations, especially if the gloved hand will be immersed in the chemical.

GLOVE CHART

Type	Advantages	Disadvantages	Use Against
Natural rubber	Low cost, good physical properties, dexterity	Poor vs. oils, greases, organics. Frequently imported: may be poor quality	Bases, alcohols, dilute water solutions; fair vs. aldehydes, ketones
Natural rubber blends	Low cost, dexterity, better chemical resistance than natural rubber vs. some chemicals	Physical properties frequently inferior to natural rubber	Same as natural rubber
Polyvinyl chloride (PVC)	Low/medium cost, very good physical properties, medium chemical resistance	Plasticizers can be stripped; frequently imported: may be poor quality	Strong acids and bases, salts, other water solutions, alcohols
Neoprene	Medium cost, medium chemical resistance, medium physical properties	N/A	Oxidizing acids, anilines, phenol, glycol ethers
Nitrile	Low cost, excellent physical properties, dexterity	Poor vs. benzene, methylene chloride, trichloroethylene, many ketones	Oils, greases, aliphatic chemicals, xylene, perchloroethylene, trichloroethane; fair vs. toluene

Type	Advantages	Disadvantages	Use Against
Butyl	Specialty glove, polar organics	Expensive, poor vs. hydrocarbons, chlorinated solvents	Glycol ethers, ketones, esters
Polyvinyl alcohol (PVA)	Specialty glove, resists a very broad range of organics, good physical properties	Very expensive, water sensitive, poor vs. light alcohols	Aliphatics, aromatics, chlorinated solvents, ketones (except acetone), esters, ethers
Fluoroelastomer (Viton) ™ *	Specialty glove, organic solvents	Extremely expensive, poor physical properties, poor vs. some ketones, esters, amines	Aromatics, chlorinated solvents, also aliphatics and alcohols
Norfoil (Silver Shield)	Excellent chemical resistance	Poor fit, easily punctures, poor grip, stiff	Use for HAZMAT work

*Trademark of DuPont Dow Elastomers