MCAA Toolbox Safety Talks

Volume II

MCAA MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA, INC.

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MCAA Toolbox Safety Talks (Volume II)
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(See instructions for the Toolbox Talks Presenter on the back of each talk)

MCAA Toolbox Safety Talks

(Volume II)

Training Documentation Sheet

#_____

The undersigned workers have participated in safety training covered by the MCAA Toolbox Safety Talk, which corresponds to the number in the space above.

1._____ 11._____

2._____ 12._____

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MCAA Toolbox Safety Talks

MCAA

Placement of Straight Ladders

#1

Proper ladder placement is essential to safe ladder use. Properly placed ladders are not likely to get knocked over or fall over when the work starts. Also, properly placed ladders avoid other hazards such as sources of electricity.

- Out of all the possible fall hazards in the mechanical industry, falls from ladders are the most common.
- Improperly placed ladders are the cause of many of these falls.
- Straight ladders must be placed at the proper pitch. For each four feet of height the ladder should be pitched out one foot from the vertical position. For example if you are accessing a platform that is 16 feet off the ground your ladder should be pitched out 4 feet from the vertical position (4-to-1 pitch).
- Be sure that both ladder rails have secure and level footings.
- Straight ladders should extend at least three feet above the landing.
- Ladders should be secured in place by being tied off at the top and/or braced at the bottom.
- Ladders should never be placed against windowpanes.
- Ladders that must be used near doorways, walkways, vehicle traffic areas, etc., should be barricaded so that an opening door or passing worker or vehicle cannot dislodge the ladder.
- Avoid placing ladders near sources of electricity like overhead power lines and open panel boxes. When you must access areas where electrical sources are present, de-energize and lockout the source of electricity.

Instructions For The Toolbox Safety Talk Presenter

Preparation:

1. Select the most appropriate talk for the week by looking through the Table of Contents on the back of the front cover.
2. Each time you choose a new talk, make a mark by the title of the talk on the Table of Contents page so you will have a record of the talks already used.
3. Photocopy the talk (one for each participant).
4. Make a photocopy of the generic training documentation sheet and write in the number of the toolbox talk you chose in the blank on the upper right hand corner of the sheet.

Presentation:

1. Answer any questions from the previous week's talk that you could not answer at the time of the talk. Then give a copy of the new talk to each participant.
2. Tell the participants to ask questions any time during the talk.
3. Read the talk slowly and clearly.
4. Relate any experiences you have had that deal with the topic of the talk.
5. Ask the participants to share their experiences with the group, but give them no more than one minute each to do so.
6. Ask whether there are any questions.
7. Tell them to record any comments they have on the back of the talk.
8. Collect the comments.
9. Have each participant sign the training documentation sheet and dismiss the group.
10. File the training documentation sheet where you can access it quickly if needed.

Follow-up:

1. Be sure to read the comments you collected and respond accordingly.
2. Remember to get the answers to any questions you could not answer previously. Start the next week's talk by answering those questions.

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Ladder Use In High Traffic Areas

#2

Using ladders in areas with lots of personnel and vehicle traffic can be very hazardous even when the ladder is properly placed and used correctly. For example, a scissors lift backing into a ladder or a worker accidentally hitting a ladder while walking by with a large piece of pipe could cause the worker on the ladder to fall. Many of the ladder falls that occur each year in the mechanical industry are caused by occurrences like these.

- When you need to use a ladder in areas where forklifts, scissors lifts, swinging doors or any other moving hazards could dislodge the ladder, you need to take some measures to protect yourself even after the ladder is properly placed.

- Before starting work, let the equipment operators and other workers in the area know that you have to place a ladder in an unusually high traffic area. Tell them specifically where you will be working and how long you plan to be there.

- If possible, schedule your work when others are at lunch or on a break.

- Set up barricades around the ladder to keep vehicle and pedestrian traffic away from the ladder.

- If for some reason you cannot set up a barricade around your ladder ask a co-worker to direct traffic around you.

- Lock swinging doors whenever possible until you move the ladder out of the doorway.

- If you can't lock a swinging door, place caution tape across it at eye level or hang a sign across it (also at eye level) to let others know you are working there.

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Inspecting Ladders

#3

Ladders are used constantly in the mechanical industry and they tend to get worn out quickly. Using ladders that are damaged and worn can be very hazardous. Several times each year mechanical workers fall from ladders that should never have been used because of broken, missing or worn out parts.

- Each time you prepare to use a ladder, perform a quick ladder inspection to make sure it will safely support you.
- Check the side rails to be sure that they are not bent, broken or cracked.
- Check for bent, broken, cracked and missing rungs or steps.
- Make sure the rungs or steps are not loose due to missing rivets or bent or missing hardware.
- Make sure each rail has a cleat at the foot of the ladder.
- Check the cleats to make sure that they are still properly attached to the ladder.
- Also check the bottom of the cleats to make sure that they are not worn to the point that the ladder could slip.
- Check all of the hardware for excessive corrosion.
- On older wooden ladders, make sure the hardware has not rusted to the point that it can't support the load.
- On stepladders, make sure the support braces are intact and properly secured to both sides of the ladder.
- Take any defective ladder out of service immediately and report the problem to your supervisor as soon as possible.

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Climbing Ladders Safely

#4

One of the most frequently occurring accidents in the mechanical industry is falls from elevations. Fifty percent of these falls are falls from ladders. The number one reason that mechanical workers fall off ladders is that they carry tools and equipment in their hands while climbing or descending ladders. Changing this habit will go a long way toward preventing falls from ladders.

- Before starting to climb a ladder, make sure the rungs or steps are not slippery from grease, mud, ice or other substances. If they are, clean the ladder carefully before you use it.
- When climbing, working on or descending a ladder always face the ladder.
- Keep your body between the rails at all times. The number two reason that mechanical workers fall from ladders is leaning out too far.
- Always maintain a three-point contact with the ladder. In other words, always have at least two feet and one hand or one foot and two hands in contact with the ladder at all times.
- Grip the rungs or steps with your hands as you climb or descend the ladder.
- Place your feet on the rungs or steps as close to the side rails as possible.
- Keep your hands free when climbing or descending the ladder. Carry your tools with you in a tool belt.
- Have your materials handed up to you or pull them up with a rope after you have reached your work area.

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Ladder Use Around Electrical Sources

#5

One of the most common electrical accidents in the mechanical industry is ladder contact with live sources of electricity. The contact is always accidental, but the consequences are usually severe. These accidents often result in severe burns and all too frequently in electrocutions. When the use of a ladder is required around electrical sources there are several things you can do to prevent an electrical accident.

- Never use a ladder around an energized source of electricity unless there is no other way.
- Before you move your ladder to the work area, de-energize and lockout the source of electricity.
- When the electrical source cannot be de-energized, make sure you use a non-conductive ladder.
- Fiberglass ladders are non-conductive. Aluminum and wooden ladders are conductive and should not be used around sources of electricity.
- Isolate yourself from the source of electricity. For example, if there is a temporary overhead power line in your work area that cannot be de-energized, check with your supervisor about having insulators placed on the line wherever your ladder could accidentally come into contact with it.
- Before using power tools from your ladder, make sure the insulation on the cords is in good shape. Don't let the cords wrap up on or get tangled up with the ladder. Be sure that all grounding prongs are in place on the plugs. Plug the tool into a receptacle that is equipped with a ground-fault-circuit interrupter (GFCI).

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#6

Ladder Use in Excavations

Work in excavations requires easy access to the work area and rapid emergency exit should the need arise. Access and exit are generally achieved with ramps, stairs or ladders. In the mechanical industry, most of the access and exit to and from excavations is done by ladder. Here are a few tips to help you use ladders properly and safely in excavations.

- Excavations are man-made depressions in the earth that are formed by the removal of earth. These tips apply to all types of excavations.

- Excavations that are four feet deep or deeper must have a ladder or some other means of access or exit.

- The ladder should be placed so that no worker in the excavation is more than 25 feet from the ladder. In many cases, more than one ladder will be needed.

- The ladder should be secured in place by being tied off at the top and/or braced at the bottom unless it will be moved constantly.

- The ladder should extend at least 3 feet above the landing area at the top of the excavation.

- The ladder landing area above the excavation and the ladder support area at the bottom of the excavation should be kept clear of spoil piles, equipment and materials so that emergency exit will not be impeded.

- Ladder rungs should be checked frequently to make sure they are not building up with mud, which could become a slip hazard. When ladder rungs become muddy, scrape the mud off.

- All other pertinent ladder requirements apply to ladders used in excavations as well.

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#7

Fall Prevention for Scissors Lifts

We experience a significant number of falls from scissors lifts in the mechanical industry, so let's go over a few of the old and some of the new fall prevention practices.

- Scissors lifts are usually equipped with guardrail systems that include top-rails, mid-rails and toeboards.

- Check the guardrail system out before you use the lift. Make sure it is securely in place and in good condition.

- Guardrail systems on the lifts have either gates or chains to protect workers from falling through the entrance and exit opening. Make sure the gate or chain is secured in the closed position before you start to use the lift.

- Many scissors lift manufacturers are recommending the use of a personal fall restraint system made up of a full body harness, lanyard, locking snaphooks and an anchorage point. The idea is to keep you from getting into a position where you could fall, not to protect you if you do fall. The lanyard should be just long enough to allow you to move around the lift, but not long enough to allow you step up on the mid-rail. Never use a lanyard with a deceleration device for fall restraint.

- Never use a personal fall restraint system on a scissors lift unless the manufacturer recommends that you do so. Anchor your lanyard only to the manufacturer's designated anchorage points and be sure to use only the locking type snaphooks with your system.

- Never step up on or lean out over a mid-rail or top-rail and never use planks, boxes, buckets, ladders or other materials to increase your height or reach from a lift.

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Fall Prevention for Aerial Lifts

#8

Fall prevention for aerial lifts is similar to fall prevention for scissors lifts, but unlike scissors lifts, a personal fall restraint system is always necessary.

- Aerial lifts always require the use of personal fall restraint systems because workers could otherwise be catapulted off the work platform while the lift is moving.

- The system should include a full body harness, lanyard, locking snaphooks and a manufacturer-designated anchorage point. Attach the lanyard only to the manufacturer's designated anchorage points on the lift. The lanyard should be long enough to allow you to move around, but short enough to prevent you from falling over the top-rail. Never use a deceleration device on your fall restraint system.

- Never use a ladder to extend your reach on an aerial lift. Also, never use boxes, buckets or other materials to create an extended platform. Avoid laying planks or other materials across the mid-rails or top-rails to extend your height or reach. Never reach out too far over the top-rail, step up on the mid-rail or top-rail or climb out of the basket.

- The number one reason for falls from lifts is reaching out too far over the top rail. All work should be done with both feet on the lift platform.

- Be sure to secure the gate or chain in the closed position before you use the lift.

- Refer to the manufacturer's written recommendations if you have any questions about fall prevention on your lift.

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Fall Protection for Mobile Scaffolds

#9

Mobile scaffolds are great tools for the mechanical trades. However, several mechanical workers fall off these scaffolds every year. In most cases the workers who fall experience severe injuries.

- The three major reasons mechanical workers fall off mobile scaffolds are working on them without guardrails, leaning out too far over the top-rails when they are in place or stepping up on the mid-rail and reaching out too far to get to the work.

- Use the scaffold only on firm level surfaces. Make sure that the scaffold pieces are held together with pigtails, toggle pins, or bolts and nuts. Never attempt to use a scaffold held together with wire, welding rods or any other substitutes.

- Fall prevention or protection is required when you work 10 feet or more above a lower level. Use guardrails for fall protection. When guardrails cannot be used, use a personal fall arrest system for fall protection.

- The personal fall arrest system should be made up of a full body harness, lanyard, locking snaphooks and an anchorage point capable of withstanding at least 5,000 pounds of force.

- Access the platform only by way of access ladder. If the scaffold does not have a built-in access ladder, properly secure an access ladder to the scaffold.

- Never step up on the mid-rail or top-rail and never lean out too far over the top-rail. Don't use ladders, buckets, boxes, planks or other materials to extend your reach.

- Avoid riding on the scaffold when it is being moved from one location to another.

- Keep the scaffold platform neat and clean to prevent slips and trips.

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Fall Protection for Fixed Scaffolds

MCAA #10

There are many different types of scaffolds, but all of them require smart fall prevention practices. Falls from scaffolds are a leading cause of fatal injuries in our industry. So let's take a look at how we can avoid them.

- Inspect the scaffold before you get on it. Make sure the scaffold legs are on a firm foundation and that the scaffold is level and plumb. Adjustment screws should be used to level scaffolds erected on uneven ground.

- Fall prevention or protection is required when you work 10 feet or more above a lower level. Check to be sure that the guardrails are securely in place and that the hardware used to hold all the pieces of the scaffold together are designed to support the maximum load. Welding rods for example, will not support the load intended by the scaffold manufacturer. Use pigtails, toggle pins or bolts and nuts.

- Cross braces are not part of a guardrail system and don't provide adequate fall protection.

- Never climb up or down on the braces of a scaffold. Use a ladder for access. If the scaffold does not have a built in access ladder secure a ladder to the scaffold.

- The number one reason that mechanical workers fall from properly constructed scaffolds is that they don't use a personal fall arrest system when guardrails are not in place.

- When guardrails cannot be used, use a personal fall arrest system for fall protection. The system should include a full body harness, lanyard, locking snaphooks and an anchorage point that is capable of supporting at least 5,000 pounds of force.

- When a section of guardrail is removed to allow for material delivery, use a personal fall arrest system until the guardrail has been replaced.

- Check with your supervisor about suitable anchorage points.

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Guardrails

#11

Guardrail systems are ideal for many fall prevention applications in the mechanical industry because they are designed to keep you from falling, but still allow you to move about freely. Guardrail systems can be used for fall prevention on scaffolds, scissors lifts, other types of aerial lifts, floor holes, roof holes, wall openings, leading edges, etc.

Guardrail systems can be made out of wood, pipe, structural steel, wire rope, etc. When a guardrail system is being used to protect you from falling, do your best to determine whether the system meets the following criteria.

- Measure to be sure that the top edge of the guardrail is between 39 and 45 inches above the working surface.

- Check out the top-rail. It should be capable of supporting at least 200 pounds of force applied in any outward or downward direction at any point on the system. You will have to use your judgment, so walk along the system and inspect it visually. Apply pressure at various points along the way. If you don't like what you see, let your supervisor know immediately.

- Check out the mid-rail as well. It should be capable of withstanding at least 150 pounds of force applied in any outward or downward direction at any point on the system.

- Check to see that mid-rails have been installed midway between the top edge of the guardrail system and the working surface.

- Make sure that the guardrail system in material hoisting areas has a gate, chain or replaceable section of guardrail in place when hoisting operations are not taking place.

- If you see a broken, defective or disconnected guardrail, let your supervisor and the other workers in the area know about it immediately. Don't work around it until it is repaired or replaced.

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Covers

#12

Covers are another excellent type of fall prevention for certain mechanical industry applications. Covers are used for fall prevention when roof or floor holes are large enough for someone to fall through, but not large enough to justify building guardrail systems. They are easy to install and remove when necessary and are capable of supporting more than the intended load when the cover material is carefully selected. Before you trust your life to roof and floor covers, there are a few things you should learn.

- Covers are typically made out of plywood or steel plates. The material used is based on the load it will be required to support.

- Covers should be capable of supporting at least two times the maximum axle load of the largest vehicle that could run over it. So a ½-inch piece of plywood won't work if fork lifts and scissors lifts will be operating in the area.

- Covers should be capable of supporting at least two times the weight of workers, equipment and materials that could step or be placed on them.

- No matter what material the covers are made from, they must be secured in place so that they can't be accidentally dislodged by workers walking by, or vehicles, materials or equipment being moved through the area.

- All covers should be clearly marked with the words "hole" or "cover" to warn workers in the area about the potential hazard. The words should be large and bold so they can be read easily from a short distance away.

- If you remove a cover to get at your work, be sure to replace it with the original cover. Don't forget to secure it back in place.

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Personal Fall Arrest Systems

#13

Personal fall arrest systems provide excellent fall protection when used properly. These systems are used for fall protection on scaffolds, wall openings, leading edges, some floor holes, etc. They are not the first choice of fall protection for most mechanical workers because they can be uncomfortable and cumbersome at times, but when other fall prevention systems are not suitable, a personal fall arrest system is very useful.

- A personal fall arrest system does not prevent you from falling. It protects you from injury if you do fall. It is referred to as a fall protection system as opposed to a fall prevention system.

- The system is made up of a full-body harness, lanyard, locking snaphooks and an anchorage point capable of supporting at least 5,000 pounds of force. Deceleration devices are available, too, and should be used whenever possible to reduce the force of the fall on your body. However, these devices are not always appropriate. They take a greater distance to stop you when you do fall, which could allow you to hit the surface or objects below.

- A full-body harness should always be used in fall arrest systems because the harness distributes the force of the fall over your thighs, pelvis, waist, chest and shoulders. The old body belts should never be used in fall arrest systems because the force is directed at the body's mid-section and can cause internal injuries.

- The attachment point of the lanyard to the body harness should be in the center of the user's back near shoulder level or above the head. The attachment point is usually a Dee-ring built into the harness. Make sure the harness is properly fitted so the Dee-ring isn't worn below shoulder level.

- Snaphooks are used to connect various parts of the system together. Use only the locking snaphooks in fall arrest systems. The old non-locking snaphooks can roll out of their attachments and if they do won't protect you if you fall.

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Personal Fall Restraint Systems

#14

Personal fall restraint systems are useful for a number of applications in the mechanical industry. The systems are very similar to personal fall arrest systems, but have a completely different function. These systems are used on some scissors lifts, aerial lifts, material hoist areas, etc.

- Personal fall arrest systems prevent you from falling in the first place, unlike personal fall arrest systems, which protect you from injury if you do fall. It is referred to as a fall prevention system as opposed to a fall protection system.

- The system is made up of a full-body harness, lanyard, locking snaphooks and an anchorage point capable of supporting at least 5,000 pounds of force.

- The lanyard selected for the job should be long enough to allow you to move about the work area, but short enough to prevent you from falling.

- A full-body harness is always preferable over a body belt in these systems, although body belts are still acceptable as long as they are never used for fall arrest purposes.

- The attachment point of the lanyard to the body harness should be in the center of the user's back near shoulder level or above the head. The attachment point is usually a Dee-ring built into the harness. Make sure the harness is properly fitted so the Dee-ring isn't worn below shoulder level.

- The attachment point of the lanyard to the body belt should be in the center of the user's back at waist level. The attachment point is usually a Dee-ring built into the belt.

- Snaphooks are used to connect various parts of the system together. Use only the locking type snaphooks.

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Walking Surface Falls

#15

When we think about falls, we typically think in terms of falls from heights like ladders, scaffolds or lifts. However, many injuries in the mechanical industry are the result of falls from the walking and working level.

- Falls from working levels are typically due to poor housekeeping. Keeping the working areas and walkways neat and clean will help prevent most of these falls.

- Bring only the amount of materials you will use that day to your immediate work area. Stack them neatly close by, but out of the way. Pick up scrap materials, especially pieces of pipe, as you work throughout the day. Place the scraps in garbage bins, drums or buckets.

- Put your smaller hand tools back in your tool belt when you are not using them. Return power tools and other equipment to the job box when you are finished with them or at the end of each day if you plan to use them throughout the day.

- Suspend welding hoses and power cords off the ground whenever you can do so safely.

- Secure covers over floor and roof holes even if the holes are too small for a person to fall through. If the hole is large enough to cause someone to trip, it should be covered.

- When pieces of building material such as conduit, rebar duct work, etc., are sticking up inconspicuously out of the floor or ground, mark their presence with flagging, cones or other easily seen materials.

- When water, ice, grease, mud or other substances make a work area particularly slippery, let your supervisor and coworkers know immediately. Try to keep people away from the area until the substance has been cleaned up or removed.

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Protection from Falling Objects

#16

The mechanical industry experiences an overwhelming number of "struck by" injuries each year. Falling objects such as tools and building materials cause most of these injuries.

- Be especially careful not to drop objects when working on a ladder, scaffold, lift, roof, floor hole or anywhere that a coworker could walk underneath you.

- Always wear your hard hat on the job site. If the falling object hits your head, the difference between having a hard hat and not having one is a headache verses a severe head injury.

- If you are working where a guardrail system is in place for fall prevention a toeboard should also be in place to prevent tools and materials from being knocked over the edge accidentally.

- When tools and equipment are piled higher than the top edge of the toeboards, screens or paneling should be installed between the working surface and the mid-rail or top-rail depending on the height of the pile.

- Barricade areas below overhead work to keep others from walking where they could be struck by a falling object.

- Where work areas can't be protected from falling objects by other means, a canopy should be installed over the work area.

- Canopies should be strong enough to prevent collapse and penetration by objects that could fall on them.

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#17

Warm-Ups for Backs

Back pain is usually the result of many different factors. Some of the most common ones include poor posture, genetic make up, the natural aging process, diet, body fat content, water consumption and smoking habits. However, strained muscles also cause back pain. Strained muscles are the result of taxing a muscle group that has not been properly warmed up. Most people stretch naturally when they get out of bed each morning. These natural stretches help us get through the day without straining our muscles. However, most people don't lift and carry heavy objects like pipe, tools and equipment every day. Think about how much warming up athletes do before they perform each day. This is especially true of weight lifters, who take especially good care of their backs. If you want to protect your back from excessive muscle strain, warm it up a little bit before you start work, and after your lunch break or any other long break in activity.

- Lie face up on the ground with your legs straight out. Bend your right leg. Grab the knee and bring it up as close to your chest as possible. Hold it there for two seconds. Repeat the process with your left leg. Complete 10 repetitions on each side trying to pull your knee in a little closer each time.

- Lie face down with your legs together. Place your hands under your shoulders in a push-up position. Straighten your elbows to push the top half of your body up as far as you can. **Keep your pelvis, hips and legs completely relaxed as you do this exercise. Don't let them come up off the ground.** Hold it for two seconds then lower yourself back down. Repeat the process 10 times trying to arch your back a little further each time.

- Stand upright with your feet slightly apart. Place your hands in the small of your back. Bend your trunk backwards at the waist as far as you can using your hands as a support. Hold it for two seconds then return to the starting position. Repeat the process 10 times trying to bend backwards a little further each time. **Be sure to keep your knees straight as you perform this exercise.**

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Stretch It Out Before You Work

#18

The purpose of stretching is to prevent muscle pulls and strains. Before you start work, take just a few minutes to stretch. You will be surprised at how good it makes you feel. If you couple the following stretching exercises with back warm ups you will be much less likely to pull or strain a muscle.

- Sit on the ground and put your left leg back behind you. Keep your right leg straight out in front of you. Grab your right leg or foot and pull your body slowly down as if to touch your chin to your knee. Go as far as you can while keeping the back of your knee firmly on the ground. When it starts to hurt hold it there for a count of 10. Reverse your position and repeat the exercise with your left leg.

- While sitting, place both feet together in front of you with the bottoms of each shoe touching the other. Grab both feet and pull them in as close to your body as possible. Using your leg muscles, push both knees down toward the ground in opposite directions. When it starts to hurt hold it there for a count of 10.

- Stand up with your feet at shoulder width. Put your arms straight out to each side of your body. Keeping your body upright twist it slowly around to the left. Go around as far as you can and hold it for 2 seconds. Then twist back to the right repeating the process. Continue this motion back and forth until you have completed the process 10 times on each side.

- While standing with your feet at shoulder width, put your arms straight out to each side of your body. Keeping your arms straight, move them in small circles in a clockwise motion. After 20 circles repeat the process in a counter clockwise motion.

- Finish stretching while standing. Relax your neck and move your head slowly around in circles in a clockwise direction. After the 20th time repeat the process in the opposite direction.

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Moving Materials and Equipment

#19

Moving materials is a daily requirement in the mechanical industry. Unfortunately, improper handling of materials results in many injuries to mechanical workers each year. However, there are a few key steps you can take that will help you prevent most material handling injuries.

- Have all materials delivered as close to your immediate work area as you possibly can.

- When you have to move materials closer to your work area, use material moving equipment such as forklifts, wheel barrels, pipe carts, dollies and hand trucks.

- Never lift and move materials that can be moved by some other means.

- When you have to lift and move heavy or bulky objects always get help from a coworker.

- Always use proper lifting techniques. Get as close to the object as you can. Bend your knees. Get a firm grip on the object. Keep your butt down and your head up. Tuck in your arms and elbows. Use your legs to raise your body and lift the object in a slow smooth motion.

- When you are carrying an object never twist your torso. Move only your feet to change direction.

- Wear gloves to protect your hands from cuts and scrapes, especially when working with sheet metal or sharp edges on pipe.

- Think ahead about where you are placing your hands when moving materials to avoid having them pinched or crushed.

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Lifting Techniques

#20

It's smart to use material moving equipment to get materials from one place to another, but once the material gets to our general work area, it must be carried to where it will be installed. To prevent back strain and other muscle strains, use one of the following lifting techniques.

- Briefly stretch your back before you lift anything heavy. Stand upright with your feet slightly apart. Place your hands in the small of your back. Bend your trunk backwards at the waist as far as you can using your hands as a support. Hold it for two seconds then return to the starting position. Repeat the process 10 times trying to bend backwards a little further each time. **Be sure to keep your knees straight as you perform this exercise.**

- Test the load before lifting anything that you are not familiar with. If it is too heavy or bulky, get help.

- **Lifting Techniques**
  No matter what type of lifting you do, these practices always apply. Keep the object close to your body. Keep the natural curves in your back. Pivot with your feet when you need to turn. Never twist your back.

- **Basic Lift**
  Get as close to the object as you can. Establish a solid base of support with your feet. Bend your knees. Keep your butt down. Get a firm grip on the object. Tuck your arms and elbows in. Keep your head up. Use your legs to raise your body and the object. Lift slowly and smoothly. Never jerk or twist while lifting the object.

- **One-Knee Lift**
  Get as close to the object as you possibly can. Get down on one knee. Lift the object to your other knee and pull it in close to your body. Get a firm grip on the object. Keep your butt down and your head up. Lift smoothly with your legs. Never jerk or twist while lifting the object.

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Anatomy of the Back

#21

Due to a number of factors, some of us experience back pain from time to time. To learn how to take better care of our backs, it is important to understand how they work.

- You have probably heard the old phrase "keep your back straight." What this phrase really means is "keep the natural curves in your spine." A healthy spine is not straight, but is slightly curved in three places.

- The spine is made up of a series of bones called vertebrae. The vertebrae are stacked on top of one another to form the spine, but are separated by cartilages called discs. The discs are filled with a semi-fluid substance, which allows it to work as a shock absorber. Each vertebra has a hole through it on the backside. The holes through each vertebrae form the spinal canal when stacked together.

- The spinal canal is a passageway for the bundle of nerves called the spinal cord. Between each two vertebrae there is a small opening on either side where a nerve exits the spinal canal. These nerves power our muscles and allow us to move, but they also allow us to feel pressure and pain.

- Too much pressure on the nerves around the spine results in back pain. Nerve pressure can result from a number of things, including inflammation of tissue in the area, a disc that has slipped out of place between vertebrae, or a ruptured disc (one that has broken open and leaked out the semi-fluid substance).

- To prevent these problems, don't abuse your back. Always keep the natural curves in your spine no matter what you are doing. This is especially true when lifting and carrying objects. Never jerk an object up when you lift it. Never twist your torso when you are carrying an object. Warm up before you lift objects and get help when they are heavy or bulky. Always use proper lifting techniques.

MCAA Toolbox Safety Talks

MCAA

Overhead Loads

#22

Unfortunately, workers in the mechanical industry experience injuries from overhead loads all too frequently. Anytime there is a load up off the ground, it is potentially dangerous. Here are some safe work practices to help you protect yourself from overhead loads.

- Overhead loads include loads being moved by cranes and forklifts, loads up on scaffolds, lifts or leading edges, loads up on shelving or racks, etc.
- Never stand or work under an overhead load.
- If you are guiding a load in from a crane, use a tagline so you can stay out from under the load and out of the load landing area.
- Establish some form of communication with crane and forklift operators. Never allow the operators to swing or carry a load over the heads of people.
- If necessary, barricade the area so people won't walk under the loads.
- If you are working in an area where materials must be moved over the heads of workers, erect a safety net or canopy that is capable of stopping the heaviest possible falling load without collapsing or allowing any part of the load to penetrate and injure a worker.
- Use a forklift to get materials in and out of overhead racks.
- If you can't use a forklift, make sure the load is safely secured in place before you approach it. If you are not sure, consult with your supervisor immediately.
- Always wear your hard hat and encourage others to do so, too.

MCAA Toolbox Safety Talks

MCAA

Forklifts

#23

Although there are many different types of forklifts, certain safe operating procedures apply to most of them. You should also know something about working safely around forklifts because in the mechanical industry, when we're not operating forklifts, someone else is probably doing so nearby.

- Operators should be trained on each type of forklift and should always carry their operator's card.
- Always inspect the forklift before you start to use it. This way you can identify any obvious defects that could affect safe operation of the forklift.
- Always check the load capacity of the forklift by checking the identification plate (ID plate). Never attempt to lift a load that exceeds the recommended load capacity. And, never attempt to pick up a load without knowing the load capacity. If the ID plate is missing, check with your supervisor immediately.
- Match the width of the forks to your load.
- Be sure that the load is centered and stable on the forks. Avoid making sudden starts, sudden stops, sharp turns, and traveling across inclines. Any one of these mistakes could cause the forklift to tip over.
- Travel only with the forks in a down position. The forks should be raised only high enough to clear any uneven surfaces.
- If your view to the front is obstructed because of the load, carefully operate the lift in reverse.
- Scan the path ahead and from side to side as you travel.
- When you are working around a forklift, make sure the operator sees you and knows where you will be working.
- Listen for the forklift and be especially alert when it comes your way.

MCAA Toolbox Safety Talks

MCAA

Safety Glasses

#24

Each day there are approximately 1,000 work-related eye injuries in the United States. Most of these occur in the construction industry. All of them are preventable. Safety glasses won't protect our eyes from all of the hazards we face, but they are the best protection against most of them.

- Safety glasses are ideal for general duty use. They are designed to protect your eyes from flying objects and particles while you are pounding, drilling, wire brushing, grinding, chipping and performing ordinary everyday tasks.

- None of us likes to wear uncomfortable safety glasses or safety glasses that fog up easily. It is nice when the safety glasses we wear all day look good on us, too.

- These days there are many different types of safety glasses available that satisfy all these requirements. However, one particular style and brand of safety glasses may not be suitable for every face. Different sizes and shapes of faces are not necessarily comfortable in the same types of safety glasses. Try different types until you find a pair that suits you.

- We can easily get glasses today that are made with anti-fog lenses, soft, pliable nose and earpieces and look really cool too. They come in regular lenses and shaded lenses for outside work as well.

- Never use general-purpose safety glasses with shaded lenses for welding, cutting, soldering or brazing. Use safety eyewear designed specifically for the task you will be performing.

- When you are grinding and chipping, you may want to wear a face shield too. However, a face shield worn without safety glasses or safety goggles will not protect your eyes.

MCAA Toolbox Safety Talks

MCAA

#25

Safety Goggles

Eye injuries are prevalent in the mechanical industry. We experience more eye injuries than most trades because we have more exposure to various eye hazards. Safety goggles are a popular form of eye protection, but they are not as popular as safety glasses because they tend to be a little less comfortable and sometimes fog up a little easier. However, there are certain tasks in our business that require their use over safety glasses.

- Like safety glasses, there are many different types of safety goggles. One type or style of safety goggle may not be comfortable on everyone. Try several different types until you find one that suits you.

- Goggles provide great eye protection for overhead work like installing pipe hangers or hanging pipe. Goggles are the best protection in this situation because dust, insulation and other particles can't drift down behind the frames and into our eyes like they can with safety glasses.

- Splash proof safety goggles are the only option for eye protection against splashing chemicals because safety glasses would allow splashing chemicals to get to the eye by dripping in behind the frames.

- Goggles can also be used for protection when you are drilling, wire brushing, grinding and chipping.

- When you are grinding and chipping you may want to wear a face shield, too. However, a face shield worn without safety goggles or safety glasses will not protect your eyes.

- Safety goggles with shaded lenses that are designed specifically for the purpose are the right choice for torch soldering, torch brazing and oxy-acetylene cutting. The shaded lenses protect your eyes from ultraviolet and infrared radiation burns as well as visible glare.

MCAA Toolbox Safety Talks

MCAA

#26

Shaded Lenses

Shaded lenses are vital in the mechanical industry because they filter out harmful ultraviolet and infrared radiation as well as visible glare. Shaded lenses are provided for welding helmets and certain types of safety goggles. Choosing the appropriate shade of a lens or lenses is as important as choosing the right type of safety eyewear. Failure to use the appropriate lenses can result in inflammation of the cornea (welder's flash) or damage to the eye's lens and/or retina.

- The American National Standards Institute (ANSI) has established a numbering system to help us identify the different shades of lenses and select the shade that is most appropriate for each specific task.

- For torch soldering, use safety goggles with #2 shaded lenses.

- For torch brazing, use safety goggles with #3 or #4 shaded lenses.

- For cutting with oxy-acetylene, use #5 shaded lenses.

- For electric arc welding, the shade of the lens you will need to attach to your welding helmet depends on the size of the electrode and the amount of electrical current being generated. Check with your supervisor to find out whether you will need a #10, #12 or #14 shaded lens.

- For gas metal arc welding, the shade of the lens you will need to attach to your welding helmet depends only on the amount of arc current being generated. Check with your supervisor to find out whether you will need a #11, #12 or #14 shaded lens.

MCAA Toolbox Safety Talks

MCAA

Tailgating

#27

Rear-end collisions are one of the most common vehicle accidents in the mechanical industry. In other words, mechanical workers are frequently running into other vehicles while driving behind them. Fortunately, all rear end collisions can be prevented.

- Rear-end collisions are caused by a vehicle following the vehicle in front of it too closely. A common mistake among drivers is assuming that a construction vehicle can stop as quickly as a regular passenger car. However, even a pickup truck can't stop as quickly as an ordinary passenger car.

- Heavier vehicles take longer to stop and therefore, require more distance to stop than lighter vehicles. A truck loaded with materials takes a lot longer to stop than the same truck operating without a load.

- At 60 miles per hour on a dry flat road an ordinary passenger vehicle takes more than 360 feet to come to a complete stop, unless, of course, it slams into another vehicle (a football field is only 300 feet long).

- A pickup truck under the same conditions takes more than 435 feet to come to a complete stop.

- A three-axle truck under the same conditions takes more than 530 feet to come to a complete stop.

- Other factors such as wet, snowy or icy roads, downhill grades or vehicle brakes that are in poor condition, significantly increase these estimated stopping distances.

- On dry pavement that is in good condition, stay at least five seconds behind the vehicle in front of you. When the pavement is wet, snowy, icy, muddy or sandy back off considerably more.

MCAA Toolbox Safety Talks

MCAA

Adjustments for Driving at Night

#28

Night driving provides different challenges to all drivers for a number of reasons. Visibility is always poor compared to daytime driving and there are typically more drivers on the road suffering from fatigue and excessive alcohol consumption. Also, drivers at night have to cope with the glare of lights from oncoming vehicles and other sources. Making a few adjustments to your nighttime driving habits will help make your trips a lot safer.

- Make sure your windshield is clean on the outside and on the inside. This will help to reduce the glare from oncoming vehicle lights. Make sure all of your mirrors are clean as well.

- If you have mirrors that are adjustable for night driving be sure to make the adjustments at night.

- Make sure your headlights are properly adjusted. If they are not or if you are not sure, have the vehicle serviced.

- Dusk is the most hazardous time to drive because humans have a difficult time seeing at dusk. Be sure to turn on your headlights before dusk.

- Give your eyes a few minutes to adjust to the darkness before you start to drive.

- Drive more slowly than usual in the dark. Your reaction time is reduced because your visibility is reduced. Slower driving gives you a little more time to react to situations that require it.

- Use your high beams when driving in extremely dark areas. The high beams will allow you to see hazards such as an animal crossing the road a little quicker, giving you more time to react. Be sure to turn your high beams off when you see oncoming traffic approaching.

- Never wear sunglasses while driving at night.

MCAA Toolbox Safety Talks

Mechanical Industry Vehicle Hazards

MCAA #29

The mechanical industry experiences five major types of vehicle accidents. Fortunately, almost all of them can be prevented with a little knowledge and perseverance.

- The number one accident experienced is rear-end collisions with the vehicle in front of us. These are caused by following the vehicles in front too closely. The solution is to stay way back from the vehicle in front of you. When the road conditions are good and the road is dry, allow at least 5 seconds between your vehicle and the vehicle in front of you. If it is wet, snowy, icy, muddy, sandy etc., increase the following distance accordingly.

- The number two accident experienced is backing into objects. These accidents are caused by not being able to see what is behind you. The solution is to get help from someone who can direct you into the spot.

- The number three accident experienced is lack of clearance. These accidents are caused by not knowing the height of the vehicle or the height of the load. The solution is to measure the maximum height of the vehicle or the load and learn the maximum height required for proper clearance before driving under overhead structures or objects.

- The number four accident experienced is collisions from improper lane changes. Improper signaling and/or failure to properly check blind spots cause these accidents. The solutions are to always use turn signals when changing lanes. Very slowly move into the lane while constantly checking the mirrors for other vehicles. Check over your shoulder for traffic in the blind spots too.

- The number five accident experienced involves collisions from leaving the road. These accidents are caused by lack of alertness or awareness. The solution is to pay attention. Refuse to be distracted by cell phones, two-way radios, food, maps, directions or any other objects.

MCAA Toolbox Safety Talks

MCAA

Vehicle Inspections

#30

Operating a vehicle safely is only part of the solution for preventing vehicle accidents. The vehicle itself has to be in good operating condition and all safety features must be working properly. The vehicles used in the mechanical industry get a lot of constant, hard use and should therefore, be inspected frequently.

- Before you operate any vehicle check it over first. It never takes more than a few minutes to do so.
- Look under the vehicle to check for fluid leaks such as oil, brake fluid, antifreeze, transmission fluid, etc.
- Check the tires for excessive wear.
- Make sure all of the tires are properly inflated.
- Turn on all of the lights and signals to make sure they are working properly.
- Try out the wipers and the horn.
- Make sure all of the mirrors are adjusted properly.
- When you start the vehicle press on the brakes to make sure you have pressure in the lines.
- Put the vehicle in reverse and listen for the back-up alarm.
- If any mechanism is not working properly, don't use the vehicle until a qualified mechanic fixes it.
- More elaborate vehicle inspections should be done each time the vehicle is taken in for routine service.

MCAA Toolbox Safety Talks

MCAA

Adjust Your Driving for Fog and Rain

#31

Vehicle operators in the mechanical industry must adjust their driving to the road conditions. Fog and/or rain change road conditions and require us to make adjustments in driving habits.

Fog

- When driving in the fog make sure you have your lights on, but don't use your high beams because the light will often reflect back off the fog and impair your vision.

- Always drive very slowly when you can't see very far in front of you. Never stop your vehicle on the road in the fog unless a traffic signal, sign or an object in the road forces you to do so.

Rain

- Always drive with your lights on.

- Use outside air instead of recycled air with your defroster to effectively remove condensation from your windshield and windows.

- Slow down to give yourself more reaction time. Give extra room to the vehicle in front of you. It will take you much longer to stop on a wet road.

- Watch your speed in areas where water could accumulate on roads such as low-lying areas at the bottom of hills or on streets where water run-off is slow. Excessive speed in these areas could cause your tires to lose contact with the pavement and ride on top of the water (hydroplane). When this happens, you lose your ability to turn, slow and stop your vehicle.

- If your vehicle starts to hydroplane, remove your foot from the gas immediately. As soon as the vehicle starts to slow it will regain traction with the pavement.

MCAA Toolbox Safety Talks

MCAA

Adjust Your Driving for Snow and Ice

#32

There are times when you have to drive in snowy and/or icy conditions. Here are a few tips to remind you how to approach this type of driving as safely as possible.

- Scrape the snow or ice off the entire windshield and all the windows you would ordinarily use for safe driving. Small areas scraped off windows do not provide you with the full view of traffic and other potential hazards. Clean the roof of the vehicle, too, so the snow does not fall down on the windshield or windows, which could block your view.

- Make sure you have the proper tires. Snow tires are ideal, but all season radial tires work well in most types of snow provided that it is not too deep. Snow and/or ice requires low speed travel, a lot of extra distance to slow down and stop, and slow deliberate turns at corners.

- Make sure you know whether the vehicle you are driving is equipped with anti-lock breaks. If the vehicle **does not** have anti-lock breaks, you can slow or stop it by lightly pumping the breaks. Don't slam on the breaks or you will likely send your vehicle into an uncontrolled skid. If the vehicle **does** have anti-lock breaks do not pump the breaks to slow or stop the vehicle. Provide slow steady pressure instead.

- If there is snow on the ground, but the sun is shining, make sure you wear sunglasses to block out the glare.

- Never drive on solid ice unless you absolutely have to do so.

- Be especially careful on bridges, overpasses and ramps, which freeze more quickly than other parts of the road.

- Watch carefully for black ice. It is difficult to see because it looks like wet blacktop. If it looks like water or looks shinny, assume it is black ice and react accordingly.

MCAA Toolbox Safety Talks

MCAA

Hazard Communication Programs

#33

You have the right to know about the chemical hazards in your work environment. All mechanical industry employers are required to establish written hazard communication programs and make them available to you. You should become familiar with all parts of your company's hazard communication program.

- Your company's program will include a list of all the chemicals you could be exposed to while working.

- The program will also describe the method your company will use to inform you about any chemical hazards that are associated with non-routine work tasks on your job site.

- The program will describe how all of the containers on the job site will be equipped with appropriate hazard warning labels written in English, identify the hazardous chemicals, state or show the proper hazard warnings and include the address of the chemical manufacturer, importer or other responsible party.

- Your company's hazard communication program will tell you where your company keeps the material safety data sheet (MSDS) file and how you can obtain it whenever you want to look at it. An MSDS is a detailed information sheet for a chemical substance. Every chemical on your company's chemical list will have its own MSDS.

- Finally, your company's hazard communication program will describe how the company will provide you with information and training on hazard communication in general.

- Always know **exactly** where your company keeps its written hazard communication program and MSDS file and how to access it immediately for emergencies or for your own information.

MCAA Toolbox Safety Talks

Material Safety Data Sheets (MSDS)

MCAA #34

Material Safety Data Sheets (MSDS) are detailed information sheets that describe the chemicals you are working with and their associated hazards. MSDSs have many sections, most of which are very technical and not particularly useful to us. However, just a few sections tell all you need to know about a chemical substance. When working with chemicals you need to know what you are working with, the hazards that are involved and how to protect yourself from those hazards.

- Section I of any MSDS provides *General Information* including an **emergency telephone number**, the name and address of the chemical manufacturer and the name of the chemical substance. The remaining sections are not necessarily in any particular order. So look at the title of each section for the information you need.

- In most MSDS's Section II is the *Hazardous Ingredients* section. This section is important because the first thing emergency medical personnel want to know are the ingredients that make up the substance.

- Another important section is the *Fire and Explosion Data* section, which will tell whether or not the substance is flammable or explosive.

- The *Health Hazard* section is equally important. It tells how the substance can get into your body, the effects of being exposed and often covers emergency first aid procedures. If emergency first aid procedures are not covered in this section, there is usually a stand-alone *Emergency First Aid* section.

- Finally, the *Special Protection* section tells you how to protect yourself from being overexposed to the substance. For example, it might recommend that you use a respirator or wear rubber gloves.

- There are other sections in MSDS's, which could be useful to you. Get familiar with the layout of MSDS's and you will be ready to take action when it's needed.

MCAA Toolbox Safety Talks

Labeling

MCAA

#35

All chemical containers on the job site should be properly labeled. When working with or around chemicals in any type of container, take a few seconds to learn about the hazards.

- Chemical container labels should be written in English. The labels should identify the hazardous chemical or chemicals inside and show or state appropriate hazard warnings. The labels should also include the name and address of the chemical manufacture, importer or other responsible party.

- One of the most common hazard warning labels is the National Fire Protection Association's (NFPA) 704 Diamond. The diamond is color coded to show the type of hazard and numbered to show the degree of the hazard.

- The red color in the 704 Diamond represents flammability hazards, the blue represents health hazards, the yellow represents reactivity hazards and the white represents information for special hazards.

- The numbering system goes from 0 to 4. The lower the number the less severe the hazard. Thus, 0 represents a minimal hazard, 1 represents a slight hazard, 2 represents a moderate hazard, 3 represents a serious hazard and 4 represents a severe hazard.

- So if you see the number 4 in the red part of the 704 Diamond on a container, don't start welding until you remove the container. The substance in the container is flammable and the flammability hazard is severe.

- In the white colored special information section of the label look for specific hazard warnings instead of numbers such as OXY for oxidizers, ACID for acid, ALK for alkali. COR for corrosives and a W with a horizontal slash through it (~~W~~) for "use no water."

MCAA Toolbox Safety Talks

MCAA

Chemical Health Hazards

#36

There are health hazards associated with many of the chemicals we use in the mechanical industry. Let's learn a little bit about these chemical health hazards that are specific to the industry.

- While working at the job site, chemicals get into our bodies primarily through inhalation, ingestion (swallowing) and absorption (through the skin or soft tissue membranes).

- The health effects of inhaling some of the chemicals that we are exposed to include lung irritation, lung cancer, lung diseases such as pneumoconiosis and asbestosis, etc. Examples of things we could inhale which could cause adverse health effects include welding fumes, asbestos, lead, etc. To protect you from these hazards, make sure there is good ventilation in your work area and wear a respirator whenever it's required.

- The health effects of ingesting some of the chemicals we are exposed to include liver and kidney cancer, reproductive damage, tumors of the intestines and blood vessels, etc. Examples of things that we could swallow which could result in adverse health effects include lead, pipe degreasers, etc. To protect yourself from these hazards don't eat, drink, smoke or apply lip balm when working around these chemicals. Wash your hands and face carefully before you do any of these things.

- The health effects of absorbing chemicals through the skin include cancer, liver and kidney damage, etc. Examples of chemicals that could be absorbed through the skin include solvents, acids, lubricants, etc. To protect yourself from these hazards, keep the substance off your skin by wearing protective clothing and impermeable gloves.

- To learn about the specific health effects of the chemicals that you are exposed to, read the *Health Hazard* section of the MSDS's for the chemicals in question.

MCAA Toolbox Safety Talks

MCAA

Chemical Flammability Hazards

#37

Many of the chemicals we use in the mechanical trades are highly flammable. Because we do so much hot work, it is important for us to learn about some of the physical properties of flammable chemicals.

- To learn about the specific, physical properties of a flammable substance read the *Fire and Explosion Data* section of the corresponding material safety data sheet MSDS. The MSDS will give you information concerning the flash point and flammability limits.

- Flammable liquids emit vapors which could ignite if there is an ignition source such as a cutting torch flame, welding sparks, grinding sparks, etc.

- The flash point is a good thing to know about any chemical substance in your work area. The flash point is the minimum temperature at which a flammable liquid emits enough vapor to burn.

- Gases and vapors of flammable liquids have a minimum concentration of vapor or gas in air required to burn. This is called the lower flammability limit (LFL). They also have a maximum concentration of vapor or gas in air, above which the concentration does not burn. This is called the upper flammability limit (UFL). The range between the LFL and the UFL is called the Flammable Range.

- Knowing the flammable range will tell you a lot about the flammability of the substance you are working with. For example the flammable range for gasoline is 1.4% to 7.6%. This means that 1.4% of gasoline and 98.6% of air is a flammable mixture as are all the mixtures up to and including 7.6% gasoline and 92.4% air. Mixtures above and below the flammable range will not burn.

MCAA Toolbox Safety Talks

Chemical Reactivity and Special Hazards

MCAA #38

Some chemicals that we use in the mechanical industry react violently when they are combined with other materials or exposed to elevated temperatures or pressures. Other chemicals that we use present special hazards and need to be used with care as well.

- For example, if you were to pour water into a container filled with acid the mixture would instantly react and probably shoot acid back in the direction from which the water was poured. Acids are considered to be special hazards.

- Other corrosive chemicals such as alkalis are considered to be special hazards, too. These chemicals should never be stored with acids.

- Oxygen reacts violently with many gases. You are already familiar with this principle because of your experience with oxy-acetylene torches. All oxidizers significantly increase the rate of combustion and are therefore considered special hazards.

- To find out about the reactivity hazards and any special hazards associated with the chemicals you will be working with, read the hazard warning labels on the chemical containers.

- If you need more information, obtain the material safety data sheet (MSDS) for the chemical substance in question. Read the section on Reactivity Data.

- Don't forget to read the section on *Special Protection*. This section will show you how to protect yourself from these hazards.

- If you still have questions, ask your supervisor or refer to the emergency telephone number in the first section of the MSDS. Call the number given and ask for help with your questions.

MCAA Toolbox Safety Talks

MCAA

Rescue Breathing

#39

If a coworker ever stops breathing you should know how to administer rescue breathing. This safety talk will walk you through the step-by-step process for administering rescue breathing. Once you have mastered this you should learn CPR (see MCAA Toolbox Safety Talk # 40).

- Before you do anything else, make sure there is no danger present such as exposed live wires, unprotected excavations, heavy traffic, etc. Place the victim flat on his or her back on a hard surface. Tap the victim on the shoulders and shout, "are you okay?" If there is no response, send someone for emergency medical help immediately.

- Open the victim's airway by tilting the head back with one hand while lifting up the chin with the other hand. Position your cheek close to the victim's nose and mouth while looking at the victim's chest. Look, listen and feel for breathing for 10 seconds.

- If there is no breathing, place a CPR mask with one-way valve over the victim's mouth. Pinch the victim's nose closed. Seal the victim's mouth over the mask with your mouth and give **2 full breaths**.

- If air does not go in, reposition the head and try again. If the airway is still blocked perform abdominal thrusts just above the belly button, i.e. Heimlich maneuver.

- Take 10 seconds to check for signs of circulation such as breathing, coughing, movement, and pulse. If there are other signs of circulation, but no signs of breathing, continue rescue breathing by giving the victim one breath every five seconds. Recheck for signs of circulation every minute. Keep administering rescue breathing until emergency rescue personnel relieve you or until there are no longer any signs of circulation.
  If the signs of circulation stop, administer CPR immediately.

MCAA Toolbox Safety Talks

MCAA

CPR

#40

(Do not proceed with this toolbox safety talk until the trainees have mastered the preceding toolbox safety talk on rescue breathing)

If you are administering rescue breathing and can't find signs of circulation, administer cardiopulmonary resuscitation (CPR) as follows:

- Place the heel of your hand approximately two-finger widths above the sternum in the center of the chest.
- Place your other hand directly on top of the first hand.
- Depress the sternum between 1½ and 2 inches on each compression.
- Perform 15 compressions, then 2 breaths.
- Repeat with 15 compressions and two breaths.
- Stop and check for circulation and breathing **every** minute.
- Take 10 seconds to check for circulation and breathing; then resume the CPR process if necessary.
- If circulation and breathing return, stop administering CPR and monitor the victim's circulation and breathing until emergency medical personnel relieve you.
- If there is still no circulation, continue administering CPR until emergency medical personnel relieve you.

MCAA Toolbox Safety Talks

MCAA

Controlling Bleeding

#41

The purpose of safety training and all of the other things we do for safety is to prevent injuries. In other words we try to prevent accidents from happening in the first place. But, if an accident does happen we need to know what to do. If someone is injured and starts to bleed, take action immediately. Severe bleeding can be a life-threatening situation.

- Before you approach the victim, protect yourself from bloodborne pathogens by putting on hypoallergenic medical exam gloves. Every first aid kit should have several pair of these gloves.

- If the bleeding appears to be severe, send someone for emergency medical help immediately.

- If the wound is on an arm or leg elevate the limb above the heart. Cover the wound with sterile gauze or some other clean cloth and apply direct pressure to the wound.

- If the cloth becomes saturated with blood add another cloth, but do not remove the saturated cloth.

- If the bleeding is severe, continue applying direct pressure uninterrupted until emergency medical personnel relieve you.

- If the bleeding is not severe, keep direct pressure on the wound uninterrupted for 5 to 10 minutes.

- Be careful with head wounds. Don't press too hard when applying direct pressure. Keep the head and neck still. Keep the victim warm and never give the victim food, water, cigarettes, alcohol or any kind of drugs.

MCAA Toolbox Safety Talks

MCAA

Recognizing and Treating for Shock

#42

Every injury that occurs is accompanied by some degree of shock. The term shock describes a condition where there is a disturbance in the ordinary amount of blood supplied to the heart and body tissue. Shock can be a life threatening condition and should be treated immediately. If the victim is not breathing, don't treat for shock until you get the breathing started. Also, be sure to get severe bleeding under control before treating for shock.

- Common causes of shock include:
  — loss of blood or other body fluids from injuries, dehydration, severe vomiting or diarrhea;
  — heart attack;
  — sepsis or toxicity such as severe blood poisoning; and
  — spinal injuries.

- If an accident victim has pale skin, bluish or grayish discoloration of the lips or fingertips, dilated pupils, a weak, but rapid pulse or an increased, but shallow breathing rate, he or she is probably in shock and should be treated accordingly.

- Send someone for emergency medical help immediately.

- If the victim is conscious and does not have a head or neck injury, difficult time breathing, chest injury or heart attack, place the vistim on his or her back and elevate the legs by propping them up on an object about 8 to 12 inches off the ground. This will increase the blood supply to the vital organs.

- If the victim has a head injury, but no suspected neck injury, elevate the head.

- If the victim has difficulty breathing, a chest injury or is suffering from an apparent heart attack, place the victim in a half-sitting position.

- If the victim is unconscious, lay the victim on his or her side and elevate the legs. This position helps prevent the unconscious victim from suffocating if he or she vomits.

- If a victim has a broken leg, don't elevate it.

- Cover the victim with a coat, blanket, tarp or some other item to keep the victim warm, but don't overheat the victim.

MCAA Toolbox Safety Talks

MCAA

Making the 911 Call

#43

Severe injuries require immediate emergency medical care. The quicker the response by you, the sooner the medical care arrives. We don't tend to think much about injuries occurring on the job site, so when they do occur we are often unprepared. Being unprepared to make the 911call slows our response, which does not work in favor of the victim. Let's look at how you can be better prepared to make the 911call.

- Find out where the telephones are on the job site. It would be a waste of time to run hundreds of yards to your company trailer if some other trade has a temporary office with a telephone somewhere in the building near by.

- Try to remember who carries cell phones. Most foremen in all trades have them on hand at all times. Remember that cell phones are not always reliable so have the location of a back-up phone in mind.

- Make sure the area you are working in has 911service. If not you will need to keep with you or commit to memory the telephone number of the closest emergency response unit.

- Emergency telephone numbers should be posted by each telephone on the job site. However, there will likely be places where the numbers are not posted so make sure you have the number handy if 911 won't work in your area.

- Learn the address of the job site before you start working there.

- If you are working in a rural area or someplace away from a main road, make sure you can give directions to the emergency response operator.

- When you reach the emergency response operator, tell the operator that you are reporting an injury that just occurred. Let the operator ask you questions. Respond to the questions slowly and clearly. Don't hang up until the emergency response operator instructs you to do so.

MCAA Toolbox Safety Talks

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Safe Use of Power Tools

#44

A number of different power tools are used in the mechanical industry. You are very familiar with most of them; however, occasionally a new or an improved tool comes around. Before you use a tool that you are not familiar with take the time to read the owner's manual. Focus on the hazard warning information and safe operation sections.

- Be sure to select the right tool for the job. Never use a tool or attachment for a job that requires heavier duty tools.

- All power tools should be grounded or double-insulated. Don't use them if they are not. If the ground prong is missing from the plug, take the tool out of service immediately and tag it with a "Danger — Do Not Use" tag so no one else will use it either. If the tool wasn't made with a ground prong, make sure it is double-insulated. Look for the words "Double Insulated" or the symbol of a small square inside of a slightly larger square.

- Make sure that the tool is plugged into a circuit that is protected by a ground fault circuit interrupter (GFCI). This should be standard practice whenever possible, but it is especially important when working in a wet or damp environment.

- Keep all of the tool guards in place unless the tool has been unplugged for cleaning. Replace the guard before you reenergize the tool.

- When using the tool don't wear jewelry, loose clothing, long hair or anything else that could get caught in the moving parts.

- Don't force the tool. If there is unusual resistance turn the tool off to find out why. Fix the problem before you proceed.

- Use the right personal protective equipment. Always use either safety glasses or safety goggles and use a face shield where appropriate.

- Make sure that your work is secured in a vice or on a table with clamps and keep the blades or bits sharp and clean.

MCAA Toolbox Safety Talks

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Safe Use and Care of Hand Tools

#45

Hand tools that are used improperly or not properly cared for frequently cause injuries in the mechanical industry. These injuries are not always life threatening, but are sometimes severe. All of them can be prevented.

- Briefly inspect the tool before you use it each time. It only takes a few seconds. If there appears to be something wrong with it don't use it. Always use the right tool for the job. Never alter a hand tool to make it fit a particular task.

- Wrenches that don't grip properly can slip and cause injury. Make sure you use the right size wrench for the job. Check to see that the jaws are not worn out. Check the teeth inside sockets and box wrenches for wear, too. And don't use a piece of pipe as a cheater bar.

- Make sure that handles in all types of hammers are not cracked or loose.

- Make sure that all tools that are supposed to be sharp are, in fact, sharp.

- Any tools with sharp edges or points should be encased in a sheath or covered by some other means when they are not being used.

- Don't use chisels or similar tools that have mushroomed heads.

- Don't toss hand tools around or throw them off ladders or scaffolds.

- Don't leave tools where they can be kicked or stepped on.

- Wipe grease, mud and dirt off hand tools and put them away in a toolbox or job box as soon as you are finished with them.

MCAA Toolbox Safety Talks

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Safe Use and Care of Your Vise

#46

Improper use of a vise for any task can result in injury. Vises are used in the mechanical industry for a number of task, so let's learn how to use them safely.

- Make sure the vise is properly secured before you start to use it. It should be bolted down with nuts, bolts and lock washers.
- Keep the moving parts of the vise lightly oiled and keep the vise's threads clean.
- Never use the jaws of a vise as an anvil. The metal in the best-made vises is not as hard as the metal used to make anvils. The vise could easily break and cause injury.
- Be careful not to apply too much pressure on the jaws when the corners of the jaws are holding the work. Too much pressure here will break off a piece of a jaw.
- Avoid using a piece of pipe or other objects to extend the length of the vise handle for additional leverage and don't pound on the handle to tighten the vise. Either of these bad practices could break the vise and result in injury.
- When clamping extra long work in the vise, support the opposite end of the work instead of over tightening the vise.
- When the object in the vise is particularly heavy, be careful not to drop it on your feet when you release the vise.
- Discard and replace any vise that shows sign of excessive wear of fracture.
- Never try to repair a vise by welding pieces back together.

MCAA Toolbox Safety Talks

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Safe Use of Grinders

#47

Several types of electric grinders are used in the mechanical industry, including angle grinders, straight grinders, tuck point grinders and bench grinders. These grinders are somewhat different, but the characteristics that make them potentially hazardous are the same. Here are the basic, safe practices to follow when using a grinder.

- Make sure the grinder is grounded. Check the plug for a ground prong. If it has been removed, don't use the grinder.
- Inspect the rest of the grinder. Look for cuts or tears in the cord, cracks in the housing, chips in the grinding wheel and missing or broken guards. If the grinder is not in good condition, don't use it.
- If you have to replace the grinding wheel use only the proper size and type of replacement.
- Make sure the replacement wheel fits freely on the spindle and doesn't have to be forced on. Don't over tighten the spindle nut. Snug it up just enough to hold the wheel in place.
- Never use a grinder without a guard properly secured in place. The guard should cover the spindle end, nut and flange projections.
- Make sure the work is properly secured before you start to work on it. Use a vise or clamps to keep it in place.
- Floor-and bench-mounted grinders should have protection hoods over the grinding wheels and work rests should be attached not more than $\frac{1}{8}$th inch from the grinding wheel.
- Always use the proper safety glasses or safety goggles and a face shield when grinding.

MCAA Toolbox Safety Talks

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Air Tool Safety

#48

In the mechanical industry air tools are used from time to time for various tasks including chipping, drilling, jack hammering, etc. Because there is so much stored energy in the air compressor tank and hoses, the use of these tools can be extremely hazardous. However, by practicing a few safe operating procedures, these tools can be safe to use.

- Inspect air hoses and attachments before you use them. Don't use any that have signs of excessive wear or damage. Replace them immediately.

- Make sure the hose is properly and securely attached to the compressor and the tool. Depending upon the type of couplings being used, you may need to use safety clips or retainers to prevent accidental disconnections. If a tool becomes disconnected while the compressor is running and the air valve is on, the hose will whip about violently and could cause serious injury to anyone close by.

- If the air hose you will be using has an inside diameter of more than ½ inch, make sure there is a safety valve at the supply source or branch line to reduce pressure if hose failure occurs.

- Don't let the hose lie in traffic areas where it could get run over by a scissors lift, forklift or other vehicles.

- Avoid using your air hose to lift or lower tools from elevations and don't allow the hose to become kinked.

- Inspect each tool before you use it. Make sure it has a properly working guard in place. If any part of the tool is defective, don't use it. Take it out of service immediately and tag it with a "Danger — Do Not Use" tag.

- Close the valve on the air supply side of the line before you change tools. There may be an air shut-off valve just before the tool attachment coupling on the hose or you may have to shut off the air supply valve at the compressor.

MCAA Toolbox Safety Talks

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Taking Defective Tools Out of Service

#49

Before you use any type of hand or power tool you should inspect it to make sure it is in good condition, the right tool for the job and capable of performing the work required. In the mechanical industry, a lot of tools are used-up in a short period of time. Some of them can be repaired, but others have to be replaced.

- If a defective tool is left lying around the work area, in a job box, toolbox or anywhere on the job site, it is probably going to be used by someone else in the area. The user may not know the tool is defective and could get hurt when using it.

- When you identify a defective tool, take it out of service immediately.

- Take the tool to the job trailer or some other designated location so no one else will use it.

- Put a large conspicuous tag on the tool that has the words "Danger — Do Not Use" written on it in large clear letters.

- Qualified electricians can sometimes fix power tool cords depending on the size and location of the problem. Don't throw power tools away unless a supervisor has inspected it and instructed you to do so.

- If you are instructed to dispose of a power tool, **make certain it is unplugged.** Then cut the cord off where it starts into the tool's housing before throwing it away.

- Make sure your supervisor knows when a tool has been discarded so that it can be replaced immediately.

- Use the same system used for taking tools out of service for ladders, scaffold pieces and other defective equipment.

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Job Site Fire Prevention

#50

There are too many job site fires each year caused by the mechanical trades. Keep these points in mind to help prevent fires.

- Poor housekeeping is a major contributing cause of job site fires. Paper, cardboard and any other combustible materials should be picked up and thrown away in a dumpster. Clean-up should occur frequently enough so that trash does not accumulate. Oily rags should be disposed of in fire-safe containers that are manufactured and approved for this purpose.

- Flammable and combustible liquids should be kept in fire-safe containers with self-closing lids that are approved specifically for this purpose. They should also be properly stored whenever they are not being used. Flammable gases like acetylene should be kept a safe distance from ignition sources. Make sure the cylinder valve is shut off when it is not in use. When you are finished with the cylinder for the day, it is a good idea to shut off the gas at the cylinder, remove the hose, attach the valve cover cap and properly store the cylinder.

- Uncontrolled sources of ignition are the other major contributing cause of job site fires. If you smoke, don't extinguish your cigarette anywhere near combustible materials or flammable liquids or gases. Make sure your cigarette butts are completely extinguished before you discard them. The same holds true for matches used for any purpose.

- Welding, cutting, torch brazing, torch soldering, grinding, operating a pipe cutter, etc., are all potential ignition sources. When welding, use fire resistant covers and spark shields to keep sparks contained in the immediate area. Make sure the proper fire extinguishers are close by. Don't forget to post a fire watch. Before you start grinding, look around and remove anything combustible or flammable. When you are finished, recheck the immediate area looking for signs of fire.

MCAA Toolbox Safety Talks

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Fire Extinguishers

#51

Fire extinguishers are required on all job sites and are especially necessary in hot work areas for operations like welding, torch cutting, etc. But, not all fires and fire extinguishers are alike, so let's take a few minutes to learn the differences.

- Fire extinguishers are rated for use based on the class of fire they are designed to extinguish. The three basic fires that we have to consider are classified as A, B and C fires.

- **Class A Fires** – These fires are made up of ordinary combustibles such as paper, rags, scrap lumber, etc. These fires require a cooling agent for extinguishment. The recommended fire extinguishers are water and soda-acid.

- **Class B Fires** – These fires are made up of flammable liquids, oils and grease. These fires require smothering for effective extinguishment. The recommended fire extinguishers are carbon dioxide, dry chemical and foam.

- **Class C Fires** – These fires are made up of electrical equipment. They require a non-conductive fire-extinguishing agent. The recommended fire extinguishers are carbon dioxide and dry chemical.

- Look at the fire extinguishers on your job site to determine what class or classes of fires they are designed to extinguish. The class or classes of fires will be clearly marked on each extinguisher.

- The best fire extinguishers for job site use are the ones that will effectively extinguish all three of these types of fires.

- If you use a fire extinguisher or see one that has a gauge indicating that it is not fully charged, let your supervisor know immediately. The extinguisher should be recharged or replaced right away.

MCAA Tool Box Safety Talks

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Job Site Fire Watch

#52

Considering all of the hot work done in the mechanical trades, it's a wonder there are not a lot more job site fires. But, there are still a significant number of fires each year caused at least in part by the work that we do. There are many things that can be done to help prevent fires. Establish good housekeeping practices, take steps to contain welding sparks and other sources of ignition, etc. But, the last line of defense against fire prevention is the use of a fire watch.

- Stop all of your hot work at least 30 minutes before you leave the job site.
- If you are not the designated fire watch, find that person and let him or her know that you are finished for the day.
- If you are the fire watch, check around the hot work areas for signs of fire such as smoldering trash piles, etc.
- Use the 30 minutes to finish other job tasks, clean up the area and put tools and equipment away.
- Go back to your hot work area at the end of the 30-minute period and check it again for signs of fire.
- If you were welding on an upper floor where sparks could have drifted to another floor or floors below you, make sure you check out these areas for signs of fire, too.
- Pay special attention to areas where combustible materials such as paper, cardboard, wood scraps and sawdust have accumulated.
- Don't forget to look for fire signs in the areas where grinding, pipe cutting or other spark-generating tasks were performed that day.