# Safety Rulebook

# SAF-1

Effective 0001
January 1, 2017

# THE BELT RAILWAY
# COMPANY OF CHICAGO
# SAFETY RULES - SAF-1

General Safety Rule Applicability

2017-SAF-1 replaces the existing Belt Railway Company of Chicago Safety Rules, and is applicable to all employees.

When rules apply to specific workgroups only, the following abbreviations will be displayed after the Rule Number and Name:

MECH: Applicable to Mechanical Department employees only
ENGR: Applicable to Engineering Department employees only
TRANS: Applicable to Transportation Department employees only

When these abbreviations are not provided, then the rule applies to employees of all departments.

Changes to rules communicated in 2017-SAF-1 are made by individual departments as necessary, and are communicated using individual department General Orders.

## 10.0 GENERAL SAFETY INSTRUCTIONS

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## 10.1 Safety Responsibilities

Safety is the most important element in performing duties.

Employees must:

- Be responsible for their personal safety and accountable for their behavior as a condition of continued employment.
- Take every precaution to prevent injury to themselves, other employees, and the public.
- When anyone is injured, do everything possible to care for them.
- Comply with all rules, policies, verbal warnings, placards, and current instructions.
- Report, correct, or protect any unsafe condition or practice.
- Be aware of their surroundings and maintain situational awareness to avoid risks associated with required tasks.
- Use good judgment when assessing the safety of all tasks to avoid injury or damage to equipment. In case of doubt or uncertainty, employees must take the safe course.
- Warn others of all unsafe work practices and conditions.
- Promptly tag (where appropriate) and report any defect and hazard and report it to your supervisor.
- Understand that the Belt Railway of Chicago has empowered each employee to work safely and risk free.
- Employees of one department whose duties are connected with, or who may find themselves under the supervision of another department must provide themselves with a copy of the applicable safety rules, and any revisions from both departments, and assure compliance with them.
- Immediately report all injuries occurring while on duty or on company property to a supervisor.
- Report all personal injuries that occur off duty that will in any way affect the employee's performance must be reported as soon as possible before reporting for duty.
- Past practices that do not conform to the rules, or place an employee at risk, are unacceptable. Continuation of unsafe practices, which endangers an employee or others, may subject the employee to disciplinary proceedings.
- When equipment is involved in a personal injury, loss of life, or damage to property, the employee in charge must immediately secure the equipment and the area.

## 10.2 Job Briefing

### Job Briefing Guidelines

- Safety, Quality, and Productivity are the result of well-planned and conducted Job Briefings.
- All employees must participate in a Job Briefing before commencing work.
- Additional Job Briefings should be conducted as necessary as conditions change throughout the tour of duty.

STEP 1. Plan the Job Briefing

A. Develop your own work plan by:
   - Reviewing work or task to be accomplished.
   - Checking the job location and work area.
   - Breaking the work or task down into step-by-step procedure.
   - Determining tool, equipment, and material requirements.
   - Determining what safety rules or procedures are applicable.

B. Consider existing and potential hazards that might be involved as a result of:
   - Job and weather conditions.
   - The nature of the work to be done.
   - The job location.
   - The tools, equipment, and materials used.
   - Equipment to be worked on.
   - Traffic conditions and visibility.
   - Time of day.
   - Safety or personal protective equipment required.

C. Consider how work assignments will be made.
   - Group assignments.
   - Individual assignments.
   - Abilities and experience of individuals.

STEP 2 Conduct the Job Briefing.

A. Explain work or task to employees.
   - What is to be done.
   - Why is it to be done.
   - When it is to be done.
   - Where it is to be done.
   - How it is to be done.
   - Who is to do it.
   - What safety precautions are necessary.

B. Discuss existing or potential hazards and ways to eliminate or protect against them.

C. Make definite work assignments.

- Make sure employees understand assignments.
- Ask questions of the "how" and "why" type.

D. If special tools, materials, equipment, or methods are to be used, make sure employees know how to proceed safely.

E. Issue all instructions clearly and concisely; check to see that they are understood.

STEP 3 Job Briefing for Special Conditions.

A. Complex jobs.
   - Cover only a portion of the job.
   - Give additional briefings as the job progresses.

B. Change in job conditions-when it becomes necessary to change plans and procedures as the job progresses, brief employees on these changes. (As an example: the weather condition changes.)

STEP 4 Follow up by Supervisor

A. It is important that frequent checks be made as the job progresses to be sure that:
   - Your plans are being followed and correct work methods used.
   - Each person is carrying out the assigned responsibilities.
   - Any hidden hazards have been identified and action initiated to eliminate or what precautions are required.

STEP 5 Individual Responsibilities

A. All employees are responsible to see that the work plan is carried out according to the Job Briefing or modified when conditions change.
   - Before work begins, when all persons including employees and contractors are present.
   - After work begins, if person(s) arrive who missed the original job briefing.
   - When changes occur to the work plan or conditions change.
   - When working in groups. Be aware of the work and movement of other group members and equipment.
   - As an avenue to discuss actions having the potential to place employees at risk and develop alternatives to accomplish such tasks safely.
   - Each work plan must consider hazards, assign specific responsibilities, and explain those assignments.

## 10.3 Lifting and Moving Material

Each person is responsible for determining their lifting limitations. Obtain additional help or mechanical assist device(s) to lift or handle heavy or awkward objects.

Observe the following principles of correct and safe lifting:

- ensure secure footing and a good grip on the materials,
- keep the object close to your body,
- keep your upper body erect,

- lift smoothly—do not use jerky motions,
- do not lift and twist at the same time.

### 10.3.1 Steps to Safe Lifting

Observe the following steps when lifting any items:

1. Check the load for size, weight, stability, and grip.
2. Make sure the pathway to be used is clear of obstructions, debris or other conditions which may cause loss of footing.
3. Choose the right lifting technique.
4. Keep the back straight, stomach in, and knees bent, lifting with legs and not the back.
5. Know your personal limits and obtain help when necessary when those limits will be exceeded by the task.
6. Check the grip, wear proper hand protection when lifting.

### 10.3.2 Lifting with Two or More Employees

Conduct a job briefing before beginning a task and define responsibilities and techniques for the type of lift being performed. One individual will give commands for all movements (lifting, walking, lowering, or throwing). Place the individual at one end of the object being lifted. Avoid walking backwards.

## 10.4 Protection of Body Parts

Do not place hands, fingers, feet, legs or any part of your body in a position where they might be struck, caught, pinched or crushed.

### 10.4.1 Safety Around Machines and Equipment

Do not enter areas where you could be caught in the operation of machinery or equipment. When tools, equipment or machinery becomes jammed or obstructed in any manner, it must be stopped and secured.

## 10.5 Door or Hatch

When opening or closing a door or hatch, face it and use handle or grab iron. Use care and keep clear of the door side or edge.

Note: See Rule 20.14, *Car Doors* and *Rule 20.19, Moving In and Out of Equipment or On Equipment*.

## 10.6 Building Safety

The following rules apply to all buildings including offices, shops, crew rooms, towers or similar structures.

### 10.6.1 Filing Cabinets

The contents of filing cabinets must be arranged and distributed so as not to make the cabinet top heavy.

### 10.6.2 Drawers

Drawers on file cabinets, desks, tool boxes, etc., must be closed when not in use. Do not have more than one drawer open at one time.

### 10.6.3 Paper Cutters

Exercise caution while operating paper cutters, trimmers and power paper punches. Keep fingers clear of the cutting blades and make sure blade guards are in position. Paper cutter blades must be left in the closed position and secured after use.

### 10.6.4 Defects

Report sharp edges, splinters or defective parts on office furniture or equipment so repairs can be made. If unsafe, appropriate action must be taken.

### 10.6.5 Cords

Permanent installations of equipment with cords (telephone, electrical, computer, etc.) that are in walking areas must be encased. Action must be taken to protect temporary installations.

### 10.6.6 Chairs and Benches

Do not stand on chairs and benches. Unsafe chairs or benches must not be used. Chairs must not be repaired or altered in any way except by an authorized repair service.

While seated in a chair, all chair legs must remain in contact with the floor.

### 10.6.7 Ice

When safe to do so, ice must be removed from over doorways, walkways or any other locations where there is danger of it falling and causing injury.

## 10.7 When Warning Traffic at Grade Crossings (NEW)

When required to be on a grade crossing to warn traffic of an approaching movement, the employee must be in a safe location to avoid injury if the motorist fails to heed the warning.

Do not stand in traffic lanes unless traffic has come to a stop.

## 10.8 Removal of Unauthorized Persons

Unauthorized persons or trespassers on company property must be told to leave the premises, unless confronting the person(s) would be unsafe. If the person(s) refuse to leave, or if confronting the person(s) would be unsafe, request immediate assistance from local law enforcement authorities.

## 10.9 Criminal Activity

Immediately contact the BRC Police Department to report any type of criminal activity or suspected criminal activity on company property. This includes, but is not limited to, trespassing, theft, burglary, assault, vandalism, switch tampering and arson.

## 10.10 Housekeeping

Good housekeeping must be maintained at all times. Dispose of garbage, water bottles, used batteries, or other refuse material (such as sun flower seeds, smokeless tobacco residues, cigarette butts, etc.) in a proper manner and in appropriate disposal receptacles. Do not discard aerosol cans in containers that may be incinerated. Company refuse facilities are not to be used for personal use.

Do not place or allow tools, equipment or other materials to remain on floors, stairways, or walkways where they could cause a slip, trip or fall.

Railroad property must be kept in a clean, orderly, and safe condition. Railroad buildings, facilities, or equipment must not be damaged or defaced. Only information authorized by the proper manager or required by law may be posted on railroad property.

Mechanical Employees handling portable flags must assure that these are not left in locations where they can be a tripping hazard or they cannot be found by employees who may need them for their work. Flags should be stored in company vehicles, when not in use.

## 10.11 Protruding Nails

Remove or flatten protruding nails or screws when removing boards or timbers or when you notice protruding nails or screws while performing duties.

## 10.12 Turning on Power

Inspect affected areas and ensure it is safe before turning on electricity, gas, steam, fuel oil, air, water or putting any machinery in operation.

## 10.13 Warning Signs

Label damaged or defective machines, switches, valves, or other apparatus with a danger sign, tag, or banner. Only authorized personnel may remove the sign when safe conditions are restored. Do not operate machines, switches, valves, or other apparatus with attached danger signs, tags, or banners.

## 10.14 Compressed Air/Gas

Use of compressed air or any gas to blow dust or dirt from the body or clothing is prohibited.

## 10.15 Drop or Throw Objects

Do not drop or throw tools, materials or other objects that might cause personal injury, fire, or equipment or property damage.

## 10.16 Fusees Storage

Fusees must be kept away from high temperatures, fire or open flame and stored:

- in proper containers in motor vehicles and other designated equipment,
- in flagging kits or racks in engines and cabooses,
- in a storage cabinet.

## 10.17 Fusee Use

Fusees must be kept away from high temperatures, fire or open flame.

Do not place fusees where they may cause a fire.

Fusees are not to be placed in locations where they may become wet. Fusees showing evidence of having been soaked in water, oil, etc., or otherwise damaged, must not be used.

To the extent practical, fusees must be kept where they cannot be obtained by unauthorized persons. Misuse or horseplay involving fusees is strictly prohibited.

When lighting fusees, hold the end to be lighted down and away from your body, striking away from the body to prevent burns to hands, feet or clothing.

Do not place lighted fusees on open bridge decks, trestles or approaches, or use them near flammable or combustible material. Extinguish the fusee after giving hand signals.

## 10.18 Confined Space Entry

Confined spaces, such as, sewers, manholes, tanks, pits, etc. may be entered by private contractors only.

## 10.19 Air Contaminants

Take precautions to reduce exposure when working around gases, fumes, mists, vapors, or dusts emitted by equipment, vehicles or work processes.

### 10.19.1 Internal Combustion Engines

Avoid excessive exposure to exhaust fumes from internal combustion engines. Such engines must not be allowed to run unless adequate ventilation exists. Do not expose fresh air intake systems to internal combustion engine exhaust.

## 10.20 Chemical Spills

Avoid contact with commodities at accident sites until the materials have been identified and safe handling procedures determined.

In the event of an oil or hazardous material spill from any source that will contaminate the ground or a waterway, if safe to do so, take steps to stop spillage.

It is the responsibility of the employee who discovers this spill to immediately notify the appropriate authority, advising:

- the location of the spill,
- material and amount spilled,
- distance to nearest public waters,
- any other information that may be pertinent.

If a fire or vapor cloud is visible from an unknown source or one known to be toxic, move yourself and others upwind to a distance of at least one half mile, further if deemed advisable, until Emergency Response personnel have advised that the area is again safe to enter.

## 10.21 Skin Protection

- Do not clean any part of your body with gasoline, solvents or with oily or dirty rags.
- Do not wear clothing that is contaminated with gasoline, solvents or oils.

## 10.22 Hazard Communication Standard

The Hazard Communication Standard (HCS), also known as Right to Know (RTK) was developed by the Occupational Safety and Health Administration (OSHA). It was designed to benefit employees and it is the responsibility of all employees to become familiar with and comply with the provisions of the HCS.

Employees must be familiar with the contents of chemical substances they work with as a preventative measure to avoid accidents and injury. Before handling containers or using chemical substances, employees must be aware of the contents and any hazardous conditions that may exist and use them according to manufacturer recommendations. They must take all necessary precautions to ensure the safety of themselves and others, and must wear approved protective equipment that may be required.

## 10.23 Drums and Containers

Label all drums, totes, tanks and containers as to contents. Drums must be kept closed, except for immediate use. When opening drums that have been exposed to heat from the sun or other sources, use proper protective equipment, stand in the clear and open slowly until the pressure is released. Do not pour contents of drums or barrels on the ground or in drains. Be certain all contents are disposed of properly. If any doubt should arise as to proper disposal of drum or barrel contents, contact your supervisor. Drums that have bung holes that are recessed or level with the barrel rim must be positioned to the side with the barrel tipped at least one inch to prevent moisture from entering barrel.

## 10.24 Working with Refrigeration Systems

Only qualified employees shall service or repair refrigeration systems and must follow manufacturer's instructions.

## 10.25 Chlorinated Solvents

Products or cleaning agents that contain chlorinated solvents are prohibited from use.

# 11.0 PERSONAL PROTECTIVE EQUIPMENT

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## 11.1 General Guidelines

Personal Protective Equipment (PPE) must be used where conditions of the job require and in accordance with rules, instructions, or directions from supervisor. Anyone entering designated areas or working near others wearing PPE must also wear the required PPE. Keep all PPE issued to you in good order, properly fitted and replace as may be required to maintain intended protection.

## 11.2 Hearing Protection

Wear approved hearing protection devices, as specified by manufacturer, in areas designated by signs or outstanding instructions, or as specified by a supervisor. In some cases, wearing dual protection devices is required, which consist of ear plugs and muffs.

### 11.2.1 Service, Repair and Mechanical Facilities

Hearing protection is required when working in or around the following service, repair, or mechanical areas:

1. Car and Locomotive Shop Buildings. When working in enclosed car and locomotive shop buildings.

   EXCEPTION: Persons in low noise areas identified by facility manager are not required to wear hearing protection. When in offices with doors and windows closed, these areas do not require hearing protection.

2. Car Repair or Service Track Buildings. When working in enclosed areas where cars are repaired or locomotives are fueled or serviced.

   EXCEPTION: Persons in low noise areas identified by facility manager are not required to wear hearing protection. When in offices with doors and windows closed, these areas do not require hearing protection.

3. Load Testing, Sand Blasting, or Grit Blasting Areas. When working close to or within areas where load testing, sand blasting or grit blasting equipment is in operation.

4. Mechanical Facilities. When working in or around mechanical facilities designated by a sign or instructions.

### 11.2.2 Locomotives

Employees must wear hearing protection anytime they are within a radius of 100 feet of a running locomotive. However, hearing protection is not required for employees who are inside the cab with the cab doors and windows closed.

### 11.2.3 Roadway or Work Equipment

Hearing protection is required within 100 feet of operating roadway or work equipment.

### 11.2.4 Other Equipment and Tools

Hearing protection is required when operating or within 15 feet of any of the following equipment or tools in operation:

- Welding or cutting equipment (oxy-fuel, gas, or electric).
- Abrasive wheel grinder or sander (pedestal, bench, or portable).
- Air lance or nozzle (for blowing compressed air).
- Chain saw.
- Nail gun (air or powder-actuated).
- Power saw, planer, router, or joiner.
- Equipment or tools powered by:
  - — Air
  - — Combustion engine
  - — Electricity
  - — Hydraulic
  - — Pneumatic
  - — Steam

### 11.2.5 Hump Retarders

Hearing protection is required when working within 50 feet or master, intermediate, group, or inert retarders.

## 11.3 Gloves

Use appropriate hand protection when hands are exposed to:

- skin absorption of harmful substances,
- cuts, lacerations or abrasions,
- punctures,
- chemicals,
- temperature extremes,
- hot metals.

Gloves or mittens must be worn by employees handling switches, derails, equipment or materials.

## 11.4 Hard Hats

Hard hats must be worn at all Locomotive, Car and Maintenance of Way facilities and work sites and in other designated hard hat areas as specified by department head. Hard hat is not required in:

- office areas and lunch rooms,
- vehicles or equipment that provide overhead protection against falling objects,
- areas exempted with documentation by the appropriate department head.

Only liners that do not interfere with fit and function of the hard hat can be worn. Baseball or similar type caps must not be worn under hard hats. Altering of hard hats or hard hat suspensions are prohibited. Hard hats must not be worn backwards, unless attachments being used are designed for such use and suspension is reversed.

Bump caps may be used by Mechanical Department Employees only when work being performed does not involve overhead lifting.

Exceptions:
Transportation employees are not required to wear hardhats when:

- moving locomotives to or from locomotive service areas,
- spotting cars within car or maintenance of way repair facilities.

## 11.5 Eye Protection

Wear company-approved eye protection in all designated areas or when specified by the appropriate department head. It is not required in:

- office areas and lunch rooms,
- enclosed vehicles (Does not include locomotives or cabooses)

### 11.5.1 Areas that Require Eye Protection

Safety Glasses. Wear spectacle-type, 100-percent safety glasses with side shields when performing duties at locomotive or car repair and servicing facilities and maintenance of way work sites, shops, and facilities. Employees requiring corrective lenses must wear either company approved prescription safety glasses or coverall-type safety goggles.

Other Glasses. Train, engine, yard and all other personnel on company property and on duty, except in an office environment, must wear glasses (FDA-approved or ANSI Z87.1-approved) They must be spectacle-type glasses that cover the entire eye area (no half glasses). Side Shields are required

### 11.5.2 Additional Eye Protection Requirements

Wear additional eye protection when performing specific work activities and follow any additional procedures specified in outstanding instructions or rules:

| TASK OR CONDITION | PROTECTION REQUIRED |
|---|---|
| Handling Acids and Caustics | • Goggles with face shield |
| Fueling Locomotives | • Goggles, or<br>• Safety glasses |
| Using powered chip-producing equipment (i.e. grinders, buffers, chippers, scalers, or rail saws) or chipping slag | • Face Shield with goggles, or<br>• Welding helmet with clear lens |
| Using or observing electric arc welding | • Proper helmet with proper lens shade and safety glasses |
| Dusty environment created by windy condition | • Goggles, or<br>• Safety glasses |
| Removing components or working overhead when dust and debris may become loose: dust and debris, or the potential for such, in the facial area when using impact tools: sanding locomotive | • Goggles required |
| Using explosive charged tools | • Goggles, or<br>• Face shield with safety glasses |
| Using chain saw | • Wire mesh face shield with safety glasses |
| Thermite welding and applying Cadwell Bonds | See Rule 18.26 (Thermite Welding) |

Note: It is essential that a good fit between the face and the contact surfaces of goggles is maintained. Safety glasses are not required when goggles are used.

### 11.5.3 Dark Lenses

The wearing of dark lenses under insufficient lighting conditions is prohibited.

## 11.6 Proper Attire

Wear clothing that allows you to perform your duties efficiently and safely. Clothing must not interfere with vision, hearing and free use of hands and feet.

Do not wear loose or ragged clothing or jewelry that has the possibility of being caught on something while operating or working with machinery or performing manual labor.

Hair, including beards, must be worn in a manner to permit safe performance of duties.

Shirts must have at least quarter-length sleeves and cover the back, shoulders, chest and abdomen. Shirts must not be unbuttoned, torn or baggy. Anyone working around equipment or moving machinery in which a shirt might become entangled must have their shirt tails tucked into their trousers. Shirts should be loose enough to allow freedom of movement, but not too loose so that they will snag easily or catch on cars, engines, tools, machinery or other equipment.

When working outside:

- and/or around cars, engines, equipment or machinery, wear trousers which cover the legs. Short trousers (cutoffs, shorts, etc.) are prohibited, and must not be worn while on duty.
- Engineering Department employees are required to wear an orange vest, shirt or outer wear. This must have reflective striping.
- Mechanical Department employees are required to wear fluorescent green leg straps.
- Transportation Department employees are required to wear an orange vest, reflectorized radio belt and leg straps, or orange reflectorized outer wear. At night, this must have reflective striping. RCO Vests fulfill this requirement.
- New Hire Trainmen will wear green vests for the first year of train service.

## 11.7 Footwear

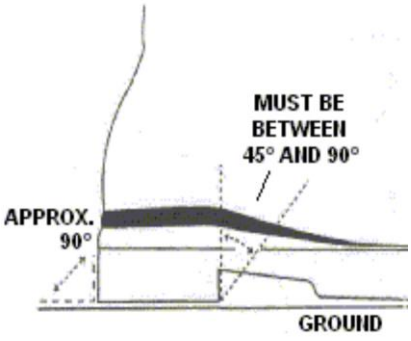
When working on uneven terrain, on or near tracks, on cars, engines or other equipment, wear footwear that affords support and protection. Footwear must have soles that provide good traction and thick enough to withstand punctures.

Footwear with laces or buckles must be tied or buckled. Do not wear excessively worn footwear or footwear with loose soles or heels.

Unless you work exclusively in an office, you must not wear thin-soled, open toe, or high-heeled shoes, sandals, gym shoes, or similar footwear.

When working in an office environment, open toed footwear is prohibited.

### 11.7.1 Defined Heel




All employees, except office workers, are required to wear footwear with a defined heel. A "defined heel" means that the back of the heel is at an approximate right angle from the sole of the shoe and from the ground when standing. The front of the heel must not be at an angle of less than 45 degrees from the sole of the shoe to the ground. Footwear with heels commonly called "riding heels" are not appropriate footwear and do not satisfy this requirement.

### 11.7.2 Covers the Ankle

Footwear that covers the ankle will be a lace up boot of approximately 6 inches or more in height. Employees who work in the field must wear footwear that covers their ankles.

### 11.7.3 OSHA Required Footwear

When working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole of the foot or electrical hazard, protective footwear as defined by the OSHA Standard 1910.136 is required. All safety toe footwear must meet ANSI Z41.1, Standard Class #75. OSHA required footwear is required for the following departments:

- Engineering
- Mechanical

### 11.7.4 Visitors and Contractors

Visitors and contractors must wear the same type of footwear as those with whom they are working. The individual responsible for the visitor shall ensure compliance with applicable rules.

## 11.8 Respirators

Before an employee is fit-tested with or issued a respirator, medical evaluation and respirator training is required.

Tight-fitting half or full face air purifying respirators require annual quantitative respirator fit-testing. Loose-fitting helmet or hood type respirators do not require fit testing, but all other requirements apply. Employees using tight-fitting half or full face air purifying respirators must not have facial hair that protrudes under the respirator seal or interferes with respirator valve functions. Employees using loose-fitting respirators must not have facial hair that interferes with respirator valve functions.

# 12.0 FIRE PREVENTION

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## 12.1 Sounding Alarm

Sound the fire alarm and summon help, when available; attempt to control and extinguish a fire only if it can be done without personal injury.

## 12.2 Operating Fire Equipment

Know how to operate the fire protection equipment at the work location.

## 12.3 Fire Protection

Fire prevention is accomplished by maintaining good housekeeping procedures. Eliminate all rubbish, trash, oily rags and towels. Do not allow the accumulation of combustible materials and debris.

## 12.4 Fire Doors and Stops

Ensure that doors, shutters, and windows used as fire stops are in good condition and that no obstructions interfere with or prevent required operation.

## 12.5 Fire Exits and Passageways

Keep all fire escapes, ladders, stairways, doorways, passageways, roadways and approaches free from obstruction and in good repair to ensure safe exit from buildings and easy access to fire-fighting equipment.

## 12.6 Questionable Fire Hazards

Immediately correct and/or inform the supervisor if you question the safe condition of gas connections, motors, wiring, gasoline or oil burning devices and vehicles or tools and equipment.

Keep lunchrooms, work areas, storerooms, attics, and basements clear of unnecessary debris or combustibles which may constitute a fire hazard.

## 12.7 Fire Protection Devices

Fire protection devices must be provided, inspected and maintained as required by local, state and federal fire codes and regulations. Tampering with such devices is strictly prohibited.

### 12.7.1 Fixed Facilities

Extinguishers must be inspected and subjected to an annual maintenance check by a qualified person. A qualified person will make an annual inspection to determine that:

- there is no evidence of physical damage,
- the seal is not broken,

- the extinguisher is fully charged,
- the extinguisher is properly tagged with inspection date noted on tag.

Fire extinguishers in buildings must be properly marked to indicate location.

Access to fire extinguishers, alarm boxes and other fire protection devices must be kept clear.

Vehicles must not be parked or material placed or stored that block fire hydrants.

### 12.7.2 Mobile Equipment

Company vehicles (except automobiles), mobile shop equipment, and ride-on-track equipment must carry a properly maintained and inspected fire extinguisher of the correct class to aid in fire suppression.

## 12.8 Fire Classifications

The four fire classifications and the type of extinguishing medium necessary to extinguish them include:

Class A. Fires in ordinary combustible materials (e.g., wood, fabrics, paper, plastics, etc.). Extinguish with water, multipurpose dry chemical, or any fire extinguisher rated for Class A fires.

Class B. Fires in flammable and combustible liquids (e.g., gasoline, oil and grease, and gases). Extinguish with ordinary or multipurpose dry chemical, Halon 1211, or carbon dioxide, all rated for Class B fires. Sand or dirt may also be used.

Class C. Fires in energized electrical equipment. Use only non-conducting extinguishing agents rated as safe for Class C fires (e.g., ordinary or multipurpose dry chemical, Halon 1211, or carbon dioxide). If electrical equipment is involved in a fire, de-energize it as quickly as possible.

Class D. Fires in combustible metal. Use only non-conducting extinguisher agents rated as safe for Class D fires (e.g. foundry flux, lith-x powder, TMB liquid, pyromet powder, TEC powder, dry talc, dry graphite, powder, dry sand, etc.). If electrical equipment is involved in a fire de-energize it as quickly as possible.

Do not use water to extinguish Class B, C, and D fires.

Employees not experienced in handling energized electrical circuits must not attempt to extinguish fires on power line poles or directly connected equipment.

### 12.8.1 Water Based Fire Extinguishers

To use portable water filled fire extinguishers follow these instructions:

- These fire extinguishers contain compressed air, prior to attempting to refill a water based fire extinguisher, ensure it is empty by depressing the handle.
- To refill, remove the collar and add water.
- Water levels should be approximately 4” from the top of the extinguisher

upon completion.

- Compress with air after re-securing the top collar on the top of the extinguisher.
- The unit is properly pressurized when the indicator is in the green field. Do not over pressurize a water based fire extinguisher.

## 12.9 Open Burning Prohibited

Burning of any kind (i.e., ties, trash, for warming, etc.) is not allowed without approval from a supervisor. A fire must be attended until it is completely out.

## 12.10 Ignition Sources

Do not smoke or use open fire:

- within 50 feet of areas where flammable or combustible liquids are being handled or stored,
- near oil storage tanks,
- in areas where LPG powered units are being serviced or stored,
- when working on or near storage batteries,
- in any designated non-smoking area.

When welding, heating or cutting on or near equipment with fuel tanks conduct a job briefing and ensure that appropriate fire prevention measures have been implemented.

Note: See Rule 12.3, Fire Protection.

## 12.11 Flammable and Combustible Liquids Storage

Flammable liquids (including paints) and combustibles must be stored in proper cabinets or designated areas and in properly labeled containers. Store all spray cans in a cool place away from direct sunlight, radiators, stoves and other sources of heat. Do not puncture, incinerate or store above 120 degrees Fahrenheit.

### 12.11.1 LPG Tanks

Tanks containing LPG must be stored in an outdoor, ventilated, sheltered area, properly secured and clearly marked “No Smoking-Keep Lights and Fires Away.”

## 12.12 Handling Flammable Liquids

Use approved containers and non-sparking tools when handling gasoline and other flammable liquids.

Label all drums, totes, tanks and containers as to contents.

Note: See Rule 10.23, Drums and Containers.

## 12.13 Cleaning and Polishing

Do not use gasoline for cleaning or polishing purposes. When using other flammable or combustible liquids for cleaning and polishing use:

- approved liquids and compounds in well-ventilated areas,
- approved storage methods for cloths, waste or other materials used in cleaning operations,
- approved cleaning tanks with self-closing lids when using solvents.

## 12.14 Fueling Track Cars, Roadway Machines, and Automotive Units

When fueling mobile equipment, other than locomotives, employees must:

1. Move equipment out of enclosed area before fueling the vehicle. (This does not apply to equipment in the shop for repair.)
2. Stop the vehicle's engine before refueling.
3. Make sure the hose nozzle on the refueling can is always touching the side of the fill opening of a tank to prevent a hazardous static electric charge. If employees use a gasoline can, it must be equipped with a standard pouring spout.
4. Avoid spilling fuel. If fuel does spill, it must be cleaned up or allowed to dissipate before starting the engine.
5. If artificial light is necessary to fill the fuel tank, use an electric lantern or flashlight.
6. Smoking or open fires near fueling operations is prohibited.

### 12.14.1 Fueling Portable Power Equipment

When fueling is necessary during use, the engine must be stopped and sufficient time allowed to cool. Tool must be removed from the immediate work area and placed where fuels cannot spill on any hot surfaces or ignition sources. Move fuel containers at least 20 feet from the work area before starting engine.

### 12.14.2 Fueling LPG tanks

Fueling of LPG tanks must be done outdoors at a location at least 15 feet from storage tanks at the end opposite from the relief valve. Portable tanks must be changed out-of- doors, where possible, and at least 50 feet from an open flame, except on outfit cars with kitchen facilities. When placing LPG tanks on motor vehicles, the engine must be stopped.

## 12.15 Heaters and Stoves

Obtain authorization before installing any non-company-furnished heating or lighting devices or appliances in company buildings. Do not use gasoline or alcohol stoves or lamps in company buildings.

## 12.16 Open Flame Starting

Do not use an open flame to warm cylinders, manifolds, carburetors, or other internal combustion engine parts before starting the engine.

## 12.17 Exhaust System

Maintain the exhaust system of internal combustion engines in a safe condition. Ensure that catalytic converters, exhaust systems and exhaust gases do not come in contact with dry grass, weeds, or flammable material.

# 13.0 AUTOMOTIVE EQUIPMENT

## VEHICLES



## BATTERIES

# 13.0 AUTOMOTIVE EQUIPMENT

## Vehicles

## 13.1 Vehicle Maintenance

Driver or supervisor assigned to a vehicle is responsible for lubrication and proper maintenance per vehicle maintenance or leasing company specifications. Drivers must record vehicle maintenance information, and retain the maintenance record inside the vehicle.

Driver must know that the vehicle is in good working order and free of any defects. They must notify their supervisor if the vehicle becomes defective. Required repairs must be completed before the vehicle is returned to service.

## 13.2 Driver Requirements

Only authorized employees may operate company vehicles. All employees who drive company vehicles must:

- possess a current, valid driver's license or commercial driver's license (CDL),
- notify their supervisor and discontinue operating vehicles at any time their license or permit has expired, been suspended, revoked or restricted.

### 13.2.1 DOT-Qualified Drivers

Drivers of company vehicles that meet one or more of the following criteria will be required to pass a knowledge and skills (driving) test to become Department of Transportation (DOT) qualified:

- operate a vehicle with gross combination weight of 26,001 pounds or more,
- operate a vehicle designed to carry 16 or more persons, including the driver,
- operate a vehicle placarded under the hazardous materials regulations because of its hazardous cargo.

Drivers must have in their possession:

- Commercial Driver's License (CDL),
- copy of medical examiners certificate card.

Drivers of vehicles with gross vehicle weight (GVW) of more than 10,000 pounds must have the following photocopies at company headquarters:

- Medical Examiner's Certificate,
- Drivers Operator's license,
- Waiver of Physical Disqualification, if applicable,
- Annual Review of Driving Record (required every 12 months).

## 13.3 Driver Responsibility

- Know and observe all local, state, and federal laws and regulations governing vehicle operation.
- Use courtesy, consideration, and good judgement to prevent accidents and control situations encountered that cannot be provided for in the law.
- Obey posted speed limits. Regardless of posted speed limits, drivers must not exceed a safe and prudent speed for their vehicle when weather, traffic, road conditions, vehicle load or any other prevailing conditions necessitates operating at a lower speed.
- Ensure the headlights are on, at all times, when the vehicle is in motion.
- Where vehicle inspections are required by departmental instructions, ensure they are done in a timely manner in accordance with applicable instructions.
- Report any and all incidents, regardless of how minor, to your supervisor. The Supervisor is responsible for contacting the BRC Police Department to complete required reports.

## 13.4 Tools and Material

Good housekeeping must be maintained in the vehicle at all times. Loose items must not be kept on rear window shelf. Tools, equipment, material and freight must be properly secured. Gross Vehicle Weight (GVW) of vehicle must not be exceeded. Do not exceed load limit of trailers.

Mechanical Department employees must ensure portable blue lights are properly secured and not affixed to the hood of vehicles at any time. (MECH)

## 13.5 Clearing Obstructions

The driver must know the vehicle and load will clear all obstructions or close clearances. Do not park the vehicle foul of any railroad track. Do not park vehicle foul of the traveled portion of a roadway unless proper warning to approaching traffic is provided.

## 13.6 Passengers

Only employees, or authorized passengers, are permitted to ride in company vehicles.

## 13.7 Seat Belts

ALL vehicle occupants must use seat belts, where provided, except high rail vehicles when operating on the track. This includes Company vehicles and privately owned vehicles used on Company business. Driver must not move a vehicle until assured all passengers are seated, and have their seat belts fastened in proper restraining position.

Seat belts will be inspected prior to use. Seat belts will not be removed from vehicles to avoid use.

Missing or defective seat belts will be replaced immediately or the vehicle will be removed from service.

Seat belt use is required while operating material handling or utility type vehicles, if so equipped, i.e., forklifts, mobile cranes, mules, utility trucks, etc.

## 13.8 Vehicle Seating

Passengers must be seated on approved seats. Do not project body parts beyond the sides or rear of the vehicle. Passengers must not be transported in truck beds.

Getting on or off moving vehicles is prohibited.

## 13.9 Backing of Vehicles

Work must be planned to minimize backing movements.

Before driving a vehicle, drivers must walk around the vehicle (except for automobiles) and make sure it is safe to move. When backing up, drivers must observe the direction of movement.

When a driver is backing up and rear-ward vision is impaired, a second individual, when available, must be near the rear of the vehicle and guide the vehicle to protect the movement. If the person who is protecting the movement disappears from the driver's view, the driver must immediately stop the movement.

## 13.10 Hazardous Materials

Do not place gasoline or other hazardous materials, including oxygen and fuel gas, in a bus or truck compartment occupied by the driver or other persons. Do not transport gasoline or other flammables in an automobile trunk except in an emergency and then only in an approved container secured against movement.

### 13.10.1 Fueling Company Vehicles

When fueling company vehicles, ensure that the proper vehicle ID key is used to record fuel dispensed.

Fueling hose must be attended when fueling, attended is defined as outside the vehicle with the hose in reach.

## 13.11 Trailers

Before towing trailers drivers must inspect:

- tires,
- hitches and safety chains,
- lights,
- equipment or material loaded on the trailer.

Any unusual condition noted must be corrected before towing is undertaken. If a trailer is equipped with brakes, the braking system must be operable. Safety chains, where required, must be used. Trailers must be equipped with required and operable stop, tail,

directional and clearance lights. Electrical connectors on trailers and vehicles must be compatible and must be connected before towing.

## 13.12 Working under Vehicles/Trailers

Sitting or lying underneath vehicles or trailers is prohibited except when making inspection or repairs and then only when the brakes are set, wheels blocked and the engine stopped and keys removed. Do not position yourself under any raised vehicle or trailer, unless proper support stands are in place.

## 13.13 Train Yard or Utility Type Vehicles

Only authorized drivers are permitted to operate train yard vehicles. Compliance with other vehicle rules, i.e., speed, inspection, etc. also apply to operating this type of vehicle. When rules for operation and care are furnished by the manufacturer they must be observed. Reckless or careless driving is prohibited. Operators of vehicles must:

- maintain control at all times,
- be prepared to stop within one half their range of vision short of any person or object,
- avoid striking standing or moving equipment or being struck by moving equipment,
- maintain sufficient clearance to tracks and equipment on those tracks. (If tracks must be fouled or proper clearance cannot be maintained, movement must be protected.),
- operate only in designated areas and over designated crossings, pathways and roadways.

Riders shall not be permitted on vehicles, unless provided with a seat.

Vehicles designed for one person must not be occupied by more than one person.

Where provided, seat belts will be worn.

Do not make adjustments or disable any speed limiting device.

# Batteries

## 13.14 Charging Batteries

Only fully trained employees when authorized by a department head can charge batteries.

When charging batteries, keep the vent caps in place to avoid electrolyte spray. Maintain vent caps in functioning condition. If necessary to bring the liquid to the correct level, use approved water. Charger must be turned off or unplugged before connecting to or disconnecting from battery. Hook the charger to the positive post first and the negative post last. When removing the charger, disconnect the negative post first and the positive post last.

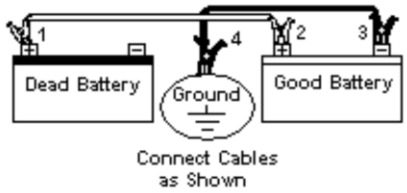
Smoking is prohibited in battery charging areas. Precautions must be taken to prevent open flames, sparks, or electric arcs in battery charging areas or around exposed batteries. The area must be adequately ventilated.

Emergency eye wash stations/showers must be located at or near permanent battery charging installations and must be inspected weekly. Plumbed systems must be flushed in conjunction with the inspection. Access must be kept clear. Tools and other metallic objects must be kept away from the top of uncovered batteries. During cold weather, keep storage batteries maintained in a fully charged condition.

## 13.15 Jump Starting

When necessary to jump a vehicle battery, the following procedure must be followed:

1. Turn off all electrical accessories in both vehicles, including company radio. Start the engine of the booster vehicle to keep its battery from being discharged.
2. Make sure the vehicles are not touching. If possible, boost on-track machines from a non-rail source (off-track vehicle/machine, booster pack or spare battery). If this is not possible, jump start the on-track machine from another on-track machine or vehicle using two sets of jumper cables to keep sparks away from either battery. After connecting one set of jumper cables to each battery, connect the negative ends of the jumper cables together first, followed by the positive ends. After starting machine, disconnect the positive ends first, followed by the negative ends.
3. Shift both vehicles into neutral or park and set the emergency brakes.
4. Check to be sure that both batteries are the same voltage.
5. Check to see that the fluid level is correct. If the fluid is frozen, do not attempt to start the vehicle.
6. Clamp one jumper cable to the positive (+) terminal of the dead battery (position 1 on diagram). Do not allow positive cable clamps to touch any metal other than battery terminal. Connect other end of positive (+) cable to positive (+) terminal of good battery (position 2 on diagram).
7. Connect one end of the second cable [negative (-)] to other [negative (-)] of good battery (position 3 on diagram). Make final connection on engine block of stalled engine (not to negative post) away from battery, carburetor, fuel line, any tubing or moving parts (position 4 on diagram).




8. Stand back from both vehicles. Start vehicle with good battery—then start the disabled vehicle. Remove cables in reverse order of connections beginning by first removing cable from engine block or metallic ground.

# 14.0 MATERIAL HANDLING

# 14.0 MATERIAL HANDLING

## 14.1 Material Storage

When stacking or storing materials and freight:

- it must be placed safely, securely and where it will not create hazardous conditions,
- do not store heavy materials on top of fragile or crushable materials,
- store heavier, bulkier materials at a height between the shoulders and mid-thigh to minimize lifting effort from bending or reaching too high,
- place in locations where people will not step on, trip over or fall on them,
- keep out of walkways and passageways, doorways, fire lanes and truck spaces,
- keep a safe distance from the edge of pits, ledges and platforms,
- place it where it will not block access to fire extinguishers, electrical panels, emergency eye washes, showers or exits,
- material stored higher than 6 feet from the ground must be palletized and should be retrieved with a forklift whenever possible,
- do not overload storage racks or areas.

## 14.2 Pallets

Only pallets in good condition are to be used. If material is to be banded to the pallet, care must be exercised to apply sufficient tension to secure the load, but not to the point of breaking the bands or damaging the pallets. In stacking loaded pallets, consideration must be given to the supporting ability of the material and packaging. Stack only to the height that can be safely supported by the material on the bottom of the stack. Pallets must not be stood or stored on end. The forklift operator must caution others working in the vicinity of the stacking operations.

## 14.3 Moving Materials

Keep material being moved under control and be prepared to stop short of obstructions or persons. Keep feet and hands clear of rollers or dollies under the load.

## 14.4 Other Protruding Objects

Before handling materials or supplies, remove or flatten sharp edges, protruding nails, screws, staples or loose ends of metal bands or wire.

## 14.5 Loading and Unloading Materials

Inspect decks or floors of trucks, trailers or railcars. If unsafe, do not move material by occupying deck or using a fork truck until condition is corrected or other means employed to handle material.

Ensure that no one is on the ground where material is being unloaded. Do not work on the ground near others who are unloading material.

## 14.6 Load Binders

The use of lever action load binders, i.e., break over binders, cam-lock binders, chain boomer, etc., are prohibited. Do not assist others in the operation of lever action load binders. All binders must be inspected and in good condition for use.

## 14.7 Drums and Barrels

When handling drums or barrels:

- test the weight of a drum before attempting to handle it,
- use approved drum handling equipment,
- assure sufficient clearance before pulling drum over on side,
- do not use feet to roll drums,
- do not attempt to up-end a filled drum without assistance or mechanical equipment.

## 14.8 Wheel Sets

Stopping movement of mounted wheels by holding the flange is prohibited. Flanges can be very sharp. Wear cut resistant or leather gloves when handling wheels. Walking in front of rolling mounted wheels is prohibited.

## 14.9 Forklifts

### 14.9.1 Training

Only employees that have been trained may operate a forklift.

### 14.9.2 Inspection

Inspect forklift prior to operation. Any unusual condition must be corrected or the forklift must be removed from service.

### 14.9.3 Operation

Forklift operators must comply with the following:

- operate at a speed that will permit stopping short of objects or persons,
- cross tracks diagonally, when possible,
- forklift with a load must be backed down ramps or inclines,
- highway vehicles and rail cars must have wheels blocked and brakes set before loading or unloading,
- travel with load as low as practical. Load must not be lifted while traveling. For clear vision, travel backwards with bulky loads,
- watch for impaired overhead clearance and rear end swing, avoiding sudden stops, jerks, turns and rough terrain,
- keep forklift clear of edge of loading docks, platforms and gangboards,
- do not use forklifts as a platform to raise or lower employees, except where an approved cage, secured to the forks and /or lifting carriage is provided,

- only the operator is allowed to ride a forklift, except where a second seat or an approved cage is provided,
- getting on or off a moving forklift is prohibited. When stopping to open or close gates or doors, adjust loads, etc., the forklift must be stopped in the clear with the hand brake set and the forks lowered to the floor or ground.

### 14.9.4 Unattended

A forklift is unattended when the operator is more than 25 feet from the machine or the operator is not in view of the machine. If the forklift is to be left unattended:

1. lower forks to ground,
2. shut off engine,
3. apply hand brake,
4. leave automatic transmissions in "park" or leave manual transmissions in low gear,
5. do not park closer than ten (10) feet to any tracks
6. do not park on inclines.

## 14.10 Hand Trucks

### 14.10.1 Operation

When possible, push a hand truck rather then pull it. When assisting another employee, push from the rear, not from the side, and stand where the view is not obstructed.

If necessary to pull a hand truck, do not jerk the handle to get over an obstruction, pull with steady force.

Do not walk backwards while pushing or pulling a hand truck or wagon.

Do not ride on hand trucks or wagons.

# 15.0 TOOLS AND MACHINERY

## General



## Hand Tools

## 15.0 TOOLS AND MACHINERY continued

### Portable Power Tools



### Fixed Machinery/Portable Equipment

# 15.0 TOOLS AND MACHINERY

## General

### 15.0 Tools and Machinery

Rules in this chapter, if applicable, apply to both hand and power tools, equipment or machinery.

### 15.1 Use of Tools and Equipment

Give the operation of tools, equipment and machinery your full undivided attention and wear required Personal Protective Equipment (PPE). Use the correct tool or equipment for the task to be accomplished in accordance with the manufacturer's operating instructions. Improvised, altered or shop made tools or equipment are prohibited. Unauthorized use of tools, equipment and machinery is prohibited.

### 15.2 Inspection of Tools and Equipment

Be familiar with the manufacturer's and/or the company's inspection/operating procedures and specific safety rules for the tools and equipment to be used. Prior to use, tools and equipment must be inspected for conditions that might cause the tool or equipment to fail. Conditions to inspect for include, but are not limited to:

- broken, bent, frayed, deformed, cracked, loose, improperly wedged, or damaged handles (wooden handles must not be taped.),
- cracks, burrs or mushrooming,
- excessive wear or cuts,
- unapproved repairs,
- missing guards or parts,
- exposure to excessive heat (as noted by difference in color, warped, etc.) that could affect the hardness or temper of the equipment or tool,
- damage from welding or cutting (as noted by cut marks, pits, gouges).

### 15.3 Safety Guards

Portable power tools, machinery and equipment must not be operated without required safety guards.

All belts, shafts, gears and other moving parts on machinery must be fully enclosed and guarded.

## 15.4 Tool Placement

Place tools in safe, secure locations and avoid doing the following:

- placing objects where they are likely to fall or be knocked off,
- placing tools or other objects on ladder rungs, hand holds, running boards, steps, uncoupling levers or other safety appliances,
- sharp edged tools should not be left lying on benches or in other places where they may cause injury, i.e., under scrap paper or rags or among tools in drawers or tool boxes.
- Power tools must not be transported by their cords or hoses.

## 15.5 Set Screws

Set screws or keys in revolving spindles or shafts and chucks must be flush, countersunk or protected by a collar unless fully enclosed and guarded from exposure.

## 15.6 Chuck Wrenches

Remove wrenches used to tighten chucks on boring mills, lathes, or drills (including portable drills) before operating the machine.

# Hand Tools

## 15.7 Purpose

Use tools only for the purpose for which they are designed. When in doubt as to the correct use of a tool, consult your supervisor.

The use of pipes or improvised extensions on tools, wrenches or other devices to gain leverage is prohibited.

## 15.8 Swinging Tools

Stay clear of the swing arc of tools. When using swinging tools, warn others to keep clear. Stand in a position that will direct the tool away from your body in the event the tool strikes a glancing blow. Do not stand on the same side as striker when holding a bar, cutter or punch.

## 15.9 Spike Maul

Inspect the tie plate area and brush away any loose material that might fly on impact. When possible set the spike from the same side of the rail you are standing on, holding the spike palm side up. Strike light blows until the spike is firmly set. Establish good footing, take a firm grip on the handle, keep your eyes on the spike head and spike by swinging the maul in a smooth arc at an even rhythm. Spike mauls must only be used for setting and driving railroad spikes.

## 15.10 Hand Adze

Remove nails, dirt, stones and other debris from the item to be handled. Straddle the item, when possible, and work the adze between the legs, keeping good control to prevent glancing blows. Cut with the grain, notching and chipping out pieces if a considerable amount is to be removed. Keep the cutting edge sharp and free of chips and use special caution when cutting cross-grained lumber, knots, etc.

## 15.11 Sharp Edged Tools

Use the proper tool for the job.

When using shape edged tools the cutting edges must be directed away from the body or hands.

If that is not possible, then the free hand and body should be in a position that place them clear of the blade stroke, and protective clothing should be worn. When wiping the blade, use a towel or cloth (not your own clothing) with the sharp edge turned away from the wiping hand.

## 15.12 Drift Pin

Use a drift pin when necessary to align holes for the insertion of rivets, bolts or pins. Fingers must not be used to align holes. Use a hammer to strike the pin. Hit the pin with light blows until it is securely seated in the hole. Be alert when driving a drift pin or bolt to make sure no one is positioned in line with it should it fly out.

## 15.13 Banding Tools

Use caution when handling banding materials and tools. When applying banding, have a firm grip on the bander and do not apply undue tension to the bands. Do not stand in direct line of bands under tension.

Bands must be cut back, secured or removed to prevent cutting or tripping hazards. Scrap banding must be placed in suitable containers for disposal or moved to a safe area. Band cutters must be used to cut band. When cutting bands from bundles, position yourself so that you will not be struck should material fall from the stack.

## 15.14 Files

Files must be cleaned by using a wire brush and not by striking against a vise or other metal object. They must not be hammered or used as a pry, punch, chisel or any other type of tool. Files must have wooden or plastic handles attached.

## 15.15 Carrying Tools

Long handled tools must not be carried in such a manner that will present a hazard to yourself or others (i.e. carry tools over the shoulder).

## 15.16 Bars and Levers

Do not sit, stand on or straddle a bar or lever. While using bars, levers or tools:

- brace yourself,
- be alert to the bar or lever slipping or moving unexpectedly,
- place hands and feet to prevent injury, do not over exert.
- Do not use bars that are broken, bent, chipped or that have been welded on.

## 15.17 Use of Claw Bars

Place the claw securely under the spike head. If you are unable to get the claw under the spike head, use the pointed end of the bar and pry up the edge of the tie plate enough to permit the claw to seat completely under the spike head, or use a spike lifter. With firm footing, stand beside the claw bar and position your hands below the notch in the handle to prevent striking hand on opposite rail, should the spike break or release suddenly. Work the spike up with short, firm thrusts. If additional leverage is needed, use a piece of wood under the heel of the claw bar. When using the claw bar to nip tie plates, be sure the end is well underneath so it will not slip. Do not strike the handle of a claw bar with another tool.

## 15.18 Lining Bars

When nipping ties or lining track, make sure the bar is placed in the ballast sufficient to prevent it from slipping out when force is applied. Apply force smoothly and assume a firm stance to maintain balance should the bar slip.

Use a piece of wood as a fulcrum to multiply your force on the tie.

Do not use a lining bar to turn a rail.

## 15.19 Rail Turners

The ratchet rail turner or rail fork is the only hand tool that may be used to turn a rail.

## 15.20 Track Jack

Track jack must be inspected before using for:

- racked base,
- broken pawl lever,
- missing ratchet or operating lever pins,
- any debris in the ratchet mechanism.

Do not strike the jack with tools to force it under a load. The jack base must be placed on an even and firm surface to prevent shifting or kicking out. The lifting surface must be placed fully under the load. No more than two people may operate the jacking lever.

A lining bar must be the only bar used to operate a mechanical track jack. Stand beside the bar and assume a stable position and pump it in an even rhythm. Do not straddle, sit or stand on the lining bar. Keep body clear of pinch points. Remove the lining bar from the jack when the jack is not being operated.

Before tripping or lowering the jack under load, make certain that all employees, tools and materials are in the clear. Jack must not be set for tripping until ready to release the load.

A track jack being used at a job site must be laid on its side when not in use. Exception: Hydraulic track jacks should not be laid on their sides.

## 15.21 Jacking Equipment

Only approved jacks will be used to lift cars. When necessary to jack a car or other heavy equipment in order to remove trucks, wheels, couplers, etc.:

- Jacks must be of sufficient capacity to handle the lift.
- Jack pad or footing under jack must be sufficient to handle the lift. If blocking is used, it must be capable of handling the lift.
- Jack must be level and the jack head must contact the jacking point as completely as possible.
- Jack or secondary support must be positioned under the load at a location where there is sufficient strength to support the equipment.
- A five-minute settling period must be observed when jacking on unpaved or uneven surfaces.

Do not jack metal against metal, except when using track jacks or vehicle jacks. When mechanical, hydraulic or air jacks are used, a piece of wood, a minimum of one-half inch and a maximum of one-inch-thick, large enough to cover the jack head, must be inserted between the jack head and the load.

Approved rubber pads may be used when using stationary jacks.

Do not go under or place any part of your body under the load or in line of applied force, unless equipment or load is secured as per Rule 15.22, Securing Jacked Equipment.

## 15.22 Securing Jacked Equipment

Follow these precautions when jacking equipment:

1. Wheels must be chocked to prevent equipment movement, except where one-spot in floor jacks are being used.
2. Do not go under or place any part of your body under equipment unless it is secured from movement and has proper secondary support in place. Secondary support shall consist of:
    - Stands or blocking of sufficient capacity to support the load.
    - In rip track or shop applications, using in-floor jacks with positive stop features or concrete jacking pads, self-locking mechanisms or load holding rings will be considered the same as using secondary support; otherwise, stands or blocking must be used.
3. To be effective, load must be lowered until a portion of it rests on the secondary support.

4. Always consider other options and methods to preclude having to place any part of your body under a jacked load or in line of applied force. When trucks are under car, use the proper tool to remove or position the center pin.

Note: Car shops using in-floor jacks with self-locking mechanism and rip tracks using concrete jacking pads with stands or blocking will be considered secondary support. Portable jacks with locking rings (i.e. electric powered hydraulic jack) will not be used as secondary support or a jack stand.

## 15.23 Use of Wrench

Take the following precautions when using wrenches:

- Place the wrench so the turn will be toward the open end of the jaws.
- Select the proper size wrench for the job. Do not use any object as a shim between the wrench jaws and the nut and bolt head, or use another object to make the wrench fit. Brace your body securely to prevent injury in case the wrench slips or the wrench, bolt, nut or other object fails.
- Make sure the wrench is pulled toward the body, whenever possible.
- Mechanical Department personnel must ensure that when removing or applying an angle cock or air hose that a 24-inch pipe wrench is used. 18-inch pipe wrenches are not proper tools to use for these types of repairs.

Note: See Rule 15.7, Purpose.

## 15.24 Use of Tie or Timber Tongs

Tongs must be set firmly and a steady force applied. When making pull, stand braced with your feet apart and with one foot behind the other. Use tie tongs when handling individual ties.

# Portable Power Tools

## 15.25 Fueling

Note: See Rule 12.14.1, Fueling Portable Power Equipment.

Equipment must be shut down prior to fueling.

## 15.26 Securing Hose Connections

Air connections must be secured and must not be uncoupled without first closing the air valve and relieving line pressure, unless equipped with quick disconnect. Wire must not be used in air or hydraulic couplings in place of clip pins.

## 15.27 Insulation/Grounding

Power cord insulation and connections on electrically powered tools shall be frequently inspected and maintained in a safe condition. Unless the tool is of the double insulated type, electric power tools must be grounded. If so equipped, the ground prong must be

used.

Note: See Rule 17.2, Electrical Cords.

## 15.28 Laying Tools Down

Do not lay down a pneumatic, electric or other power tool with the motor running. Power tools must be placed so they will not be started accidentally. When unattended, the power source must be disconnected.

Do not lay power tools on wet surfaces or in loose soil.

## 15.29 Impact Wrenches

Do not use hand sockets on impact wrenches. Nails, wire or cotter pins must not be used to hold sockets in place.

## 15.30 Nail/Staple Guns

Keep nail/staple guns pointed away from the body and other persons. Ensure that no one is located behind the object being nailed or stapled into.

## 15.31 Powder-Actuated Tools

Only authorized employees are permitted to use powder-actuated tools (i.e., Hilti guns, nail guns, etc) and must follow manufacturer's instructions. Treat powder actuated tools with the same respect extended to firearms.

## 15.32 Chain Saw

Follow the manufacturer's instructions when operating chain saws. Operators must wear:

- steel mesh face shields with safety glasses,
- gloves,
- chain saw chaps,
- hearing protection.

All chain saws should have a chain brake. Those saws not equipped with a chain brake must have a tip protector.

Be alert for conditions which may adversely affect footing and safe operation of the saw. Avoid cutting directly overhead. Where there is a fire hazard, a fire extinguisher and shovel must be immediately available when using a chain saw.

## 15.33 Weed/Brush Cutting

Before operating grass, weed or brush cutting devices make sure guards are in place.

## 15.34 Rail Saws

Rail saws are only to be used to cut rail.

When operating a rail saw:

- Do not operate a rail saw unless you have been properly trained in its safe use and follow all of the manufactures instructions.
- The guide support arm must be used when cutting rail (freehand cutting is prohibited).
- Warn others that you are about to begin cutting rail.
- Personnel are prohibited from standing in front of the rail saw when rail is being cut.
- Required Personnel Protective Equipment (PPE) must be used when operating a rail saw.
- Inspect equipment regularly to ensure it is operating safely and efficiently.

# Fixed Machinery/Portable Equipment

## 15.35 Authorized Employees

Only trained employees are permitted to operate machinery or equipment.

## 15.36 Servicing Machines

Follow manufacturer's recommendations for servicing machinery. Ensure that all safety guards or safety devices are replaced and operable before machine is returned to service.

## 15.37 Band Saws

The length of blade exposed must be no greater than the thickness of the stock being cut plus one half inch. Stock must be fed gradually and steadily. The blade must not be twisted or crowded.

## 15.38 Woodworking Machines

Exercise caution when operating woodworking machines:

- Stand to one side and not directly in back of the material being fed to any saw.
- Use a push stick to feed narrow material.
- Do not reach over circular saws.
- Do not operate circular rip saws with the hood, spreaders or kick back devices removed or rendered inoperative.
- An effective device must be provided to return the radial saw automatically to the back of the table when it is released at any point of travel.
- Joiner must have a guard that automatically adjusts itself to cover the part of the cutting head not protected by the material being processed. The guard must provide protection for the entire length of the cutting space. The exposed part of the cutting head at the rear of the fence must be covered, and the knife must not project more than one-eighth inch beyond the cylindrical body of the cutting head.
- Dead plates on planers must not be lowered while material is in the machine and the machine is running.

## 15.39 Clamping Material

Material must be firmly clamped to the machine before work is performed, where required.

## 15.40 Removing Chips

Do not remove chips or shavings from a drill press lathe or other machine by hand. Use a brush, vacuum equipment or tools made for that purpose.

## 15.41 Pedestal or Bench Mounted Abrasive Grinders

### 15.41.1 Mounting

Prior to mounting, all wheels must be inspected for damage and cracks. Wheels which show any evidence of cracks, abusive handling or abusive storage shall not be mounted. Before mounting, spindle speed of grinder must be checked to ensure that it does not exceed the maximum operating speed marked on the wheel.

Blotters must be used between flanges and abrasive wheel surface to insure uniform distribution of flange pressure. Flanges must be the same size and shall not be less than one third the wheel diameter. The blotters shall cover the entire contact area at the wheel flanges.

### 15.41.2 Crack Detection Test

When performing a Ring Test:

- The ring test depends on the damping characteristics of a wheel to alter the sound emitted when the wheel is tapped lightly.
- To perform the ring test, wheels should be tapped gently with a light non- metallic tool, such as the handle of a screwdriver.
- Support the wheel through the center hole with a non-sound conducting holder such as a wooden dowel.
- Tap wheel about 45 degrees each side of the vertical center line and about one or two inches from the periphery.
- Rotate the wheel 45 degrees and repeat the test.
- This will result in four locations on the wheel being tested.
- A sound and undamaged wheel will give a clear tone. If cracked, there will be a dead sound. If this occurs, the wheel must not be used.
- Wheels must be dry and free from sawdust when applying the ring test.

### 15.41.3 Using Grinders

When using grinder:

- Prior to doing any work with the grinder, the operator must stand to the side of the machine and check for excessive vibration.
- Should there be excessive vibration, the machine must be shut down and supervisor notified.
- When wheel is cold, apply grinding force gradually and uniformly to prevent thermal shock which may cause wheel to break.
- Do not grind on sides of abrasive wheels.
- Do not allow the tool rest to be more than one eighth inch from the stone.
- Do not allow the distance between the wheel periphery and the adjustable tongue to be more than one-fourth inch.
- Immediately report and replace broken or missing shields.
- If needed, protect arms with a long sleeved shirt and use leather gloves to hold material while grinding. However, glove fingertips must not extend past the outer edge of the tool rest.
- Do not use welding gloves or rags to hold material while grinding.
- Only grind material for which the wheel is designed. Do not grind non-ferrous material (i.e., aluminum, brass or plastic) on wheels designed for grinding steel.
- Regularly check all grinding tools for proper spindle speed, especially if the tool has been dropped.

### 15.41.4 Wire Brush Wheels

When using wire brush wheels:

- Follow the manufacturer's recommended wheel speed.
- Make sure the hood is adjustable and encloses the wheel as completely as the work allows.

The hood should cover the exposed arbor ends, if not, install a smooth-headed nut.

# 16.0 MECHANICAL LIFTING/PULLING OPERATIONS

## General



## Mobile



## Overhead Cranes/Hoists



## Wire Rope

## 16.0 MECHANICAL LIFTING/PULLING OPERATIONS continued

### Rigging

# 16.0 MECHANICAL LIFTING/PULLING OPERATIONS

## General

### 16.1 Authorized Employees

Only authorized employees are permitted to operate cranes, hoists, and mechanical lifting/pulling devices. Before authority is granted, employees must be trained in the rules and procedures regarding the equipment's operation and use.

When rules for operation and care are furnished by the manufacturer, they must be observed.

### 16.2 Inspection

All hoisting equipment and rigging must be inspected before use and periodically as required. If defects are found, they must be corrected or equipment must be removed from service.

### 16.3 Safe Load

Do not overload hoisting and rigging equipment.

Do not side-load or drag a load with hoisting equipment. Raise and lower the load steadily and gradually and do not drop or jerk the load or tackle.

Remove buckets or magnets from crane when handling loads with slings.

### 16.4 Ground Man

When a crane or similar unit is being used, when needed, the helper or supervisor in charge, must act as ground man or assign a competent person as ground man.

The ground man is responsible for directing and safe-guarding all machine movements. Before signaling boom or machine movement, the ground man must see that the load, cab or boom will not come in contact with nearby wires, structures or other objects and persons. Groundmen required to move cars or on-track equipment must be qualified on the use of their braking systems.

Note: See Rule 17.7.1, Proper Clearances.

### 16.5 Crane Operator

The crane operator is responsible for the safety of the crane and for the safety of employees working in the vicinity. He will only take signals given by the ground man, unless the signal is a stop signal.

Equipment controls must not be left during a lift or when a load is suspended, or with the master clutch engaged.

## 16.6 Signals

Use the following signals while operating cranes and hoists. Hand signals must be used whenever possible. If crane hand signals cannot be used, crane audio signals may be used. The crane operator and ground man must agree beforehand on the signals to be used and must use only these approved signals. The crane operator is governed by these signals:

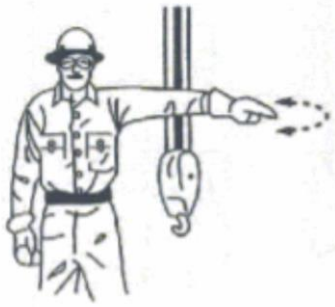
### 16.6.1 Crane Hand Signals

The person giving signals must:

- make sure signals can be plainly seen,
- give signals clearly so they can be understood.

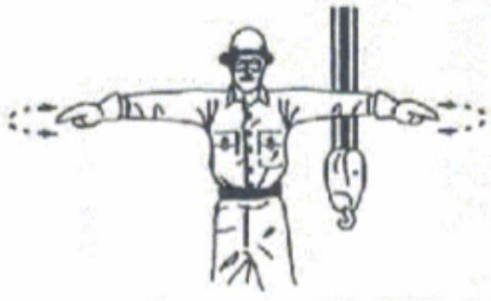
If the person giving signals disappears from the view of the crane operator, movement must be stopped.

STOP



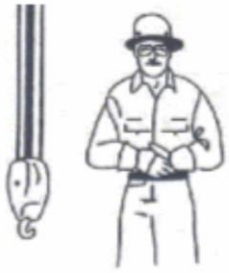
**Stop:** Arm extend, palm down, move arm back and forth horizontally.

EMERGENCY STOP



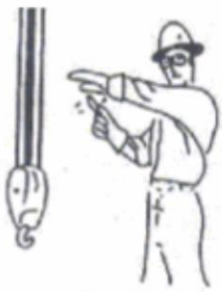
**Emergency Stop:** Both arms extend, palm down, move arms back and forth horizontally.

DOG EVERYTHING



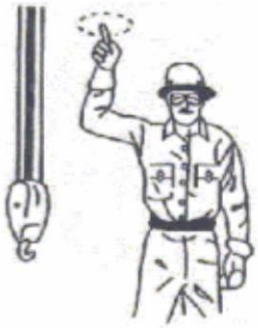
**Dog Everything:** Clasp hands in front of body.

MOVE SLOWLY



**Move Slowly:** Use one hand to give motion signal and place other hand motionless in front of hand giving the motion signal.

## HOIST

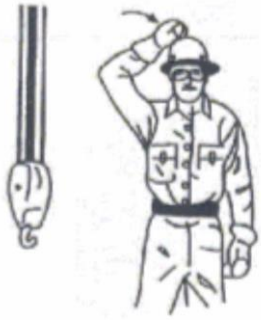


**Hoist:** With forearm vertical, forefinger pointing up, move hand in small horizontal circle.

## LOWER

**Lower:** With arm extended downward, forefinger pointing down, move hand in a small horizontal circle.

## USE MAIN HOIST

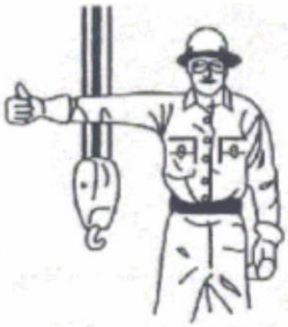


**Use Main Hoist:** Tap fist on head, then use regular signals.

## USE WHIP LINE

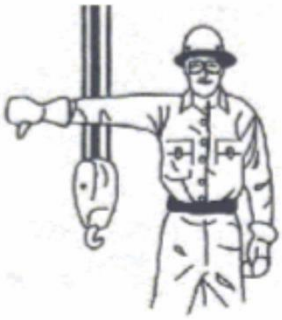
**Use Whip line:** (auxiliary Hoist) tap elbow with one hand, then use regular signals.

## RAISE BOOM



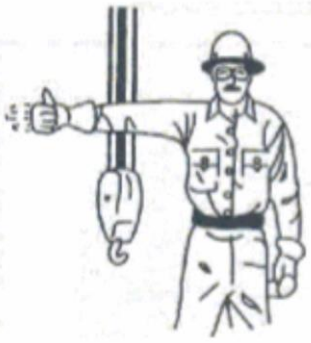
**Raise Boom:** Arm extended, fingers closed, thumb pointing upward.

## LOWER BOOM



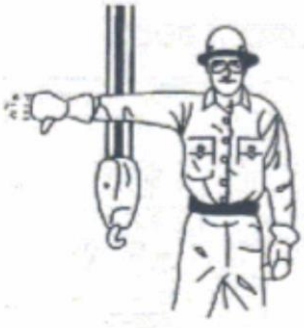
**Lower Boom:** Arm extended, fingers closed, thumb pointing downward.

## RAISE THE BOOM AND LOWER THE LOAD



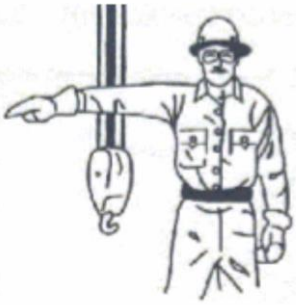
**Raise Boom and Lower the Load:** With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

## LOWER THE BOOM AND RAISE THE LOAD



**Lower Boom and Raise the Load:** With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

## SWING



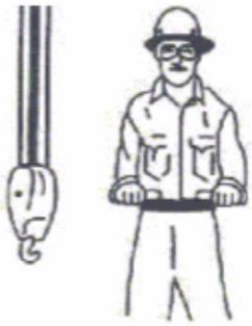
**Swing:** Arm extended, point with finger in direction of swing of boom.

## RETRACT BOOM

(Telescoping Boom)

**Retract Boom:** (telescoping booms) One hand signal, fist in front of chest, thumb extended out, heel of fist tapping chest.

## RETRACT BOOM
(Telescoping Multiple Booms)

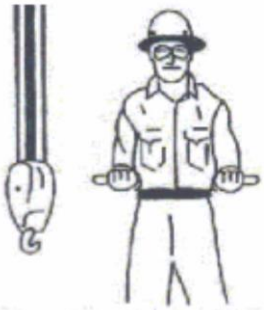


**Retract Boom:** (telescoping booms) Both fists in front of body with thumbs pointing toward each other.

## EXTEND BOOM
(Telescoping Boom)

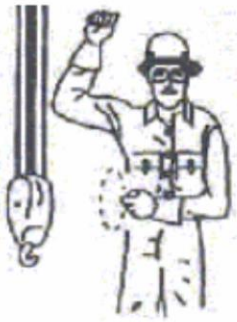
**Extend Boom:** (telescoping boom) One hand signal, fist in front of chest, thumb extended and tapping chest.

## EXTEND BOOM
(Telescoping Multiple Booms)



**Extend Boom:** (telescoping booms) Both fists in front of body with thumbs pointing outward.

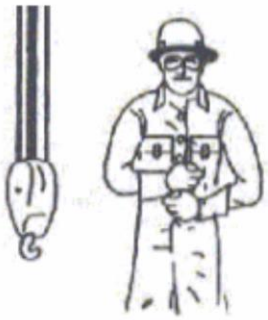
## TRAVEL
(One track. For crawler cranes only.)



**Travel:** (one track crawler cranes) Lock the track on the side indicated by the raised fist, and travel opposite track in direction indicated by circular motion of other fist rotated vertically in front of body.

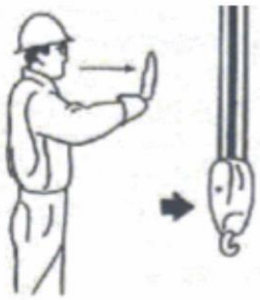
TRAVEL

(Both tracks. For crawler cranes only.)



**Travel:** (both tracks crawler cranes) Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward.

TRAVEL



**Travel:** Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.

## 16.6.2 Crane Audio Signals

If voice communication is utilized, the voice commands by the ground man to the crane operator shall be in a continuous manner with a pause between a common command of approximately one second in duration per ten feet to the desired lift height. If the proper communication stops, or is not understood, all crane movements shall stop immediately. If special voice commands are required to perform the lift, they shall be mutually agreed upon between the ground man and the crane operator before lifting begins.

Voice Commands shall be as follows:

**UP ON THE LOAD,**

**DOWN ON THE**

**LOAD, BOOM UP,**

**BOOM DOWN,**

**BOOM UP AND LOWER THE LOAD,**

**BOOM DOWN AND RAISE THE**

**LOAD, SWING LEFT,**

**SWING**

**RIGHT,**

**EXTEND OUT,**

**RETRACT IN,**

**STOP.**

## 16.7 Emergency Stop Signals

Anyone can give emergency stop signals. The crane operator must immediately recognize and act upon any stop signal or any other motions or movements that might indicate such action is necessary.

## 16.8 Positioning

When working with cranes or other hoisting devices, the ground man and those in the vicinity must:

- position themselves where they cannot be caught between the load being handled and an obstruction,
- stay clear of loads being suspended,
- not be under the crane boom or similar machine when it is lifting or suspending a load,
- not stand near or in line with a cable, rope or chain under tension or one that might be tightened at any moment,
- not walk or stand in the path of a load being handled by a crane, hoist or wrecker.

When equipment is being handled by chains, cables or wire ropes, care must be taken to avoid injury in case of breakage. Loads must not be suspended from booms unless the work requires.

In such cases, keep the load secured and as close to the ground as possible. Loads being transported from one point to another must be landed on a flat car or other conveyance to release the weight from the boom during transit.

## 16.9 Raising Personnel

Do not use cranes and derricks to raise or lower persons or any personnel platforms. Only raise and lower persons in an approved aerial basket designed for that purpose. Do not ride on loads or rigging.

## 16.10 Operation with Trains Passing

When trains are passing on adjacent tracks, if any part of equipment or load can foul adjacent tracks, crane operators must make sure:

- work is stopped,
- swing brakes on machines (so equipped) are set,
- tongs, buckets, loads, or lines come to rest on the ground or car.

## 16.11 Load Control

A load that is suspended or being lifted should be pushed instead of pulled. Hands must not contact wire rope or sheaves on hoisting equipment with load attached unless absolutely necessary, and then only after notifying operator. Where necessary, use non-conductive tag lines or a non-conductive push stick to prevent uncontrolled movement.

Precautions must be taken to ensure against load swaying or turning. Crane, hoist or wrecker must not be moved if load is swaying or turning excessively.

When moving a suspended load through a shop by means of a remote control device, the operator must walk with the load in a clear and safe position.

## 16.12 Avoiding Falls

Maintain secure footing and a firm hand hold to avoid falling when standing on load to adjust cable, chain, sling or hook.

## 16.13 Pulling Applications

When wire rope, chain, synthetic tow straps or similar devices are used for pulling applications (i.e., dragging rail, straightening safety appliances, aligning drawbars, towing vehicles, etc.), take precaution to avoid personal injury or property damage.

- Inspect the equipment to ensure it is in good condition and has the capacity to handle the task.
- Protect pulling device from sharp corners or objects.
- Do not jerk against the load being pulled. Make all movements smoothly.
- Position yourself and others where no one can be struck or injured should the pulling device or attachments fail. Protect yourself from possible whipping or recoil action should the device release suddenly.

# Mobile Cranes

## 16.14 Safe Load Placard

Equipment for lifting, hoisting or handling material must have a placard posted where it is visible to the crane operator. The placard indicates the safe loads at various radii. Crane operators must be familiar with the safe lifting capacity, at minimum and maximum radius and with or without outriggers, as specified on the placard. Do not handle loads that exceed the load chart capacities.

## 16.15 Boom Inspection

Booms must be lowered for inspections, lubrication and repairs.

## 16.16 Handling Equipment in Work Train

When equipment with booms, leads or other attachments is being handled in work train service, the crane operator must remain on the machine during all movements of the train unless the machine has been securely blocked to protect against swinging or other movements that may cause an accident.

Properly block machines mounted on top of or working from flat cars to prevent the machine from moving when cars are being switched or moved. Do not block the machine when it is being used and is under the control of a crane operator.

# OVERHEAD CRANES/HOISTS

## 16.17 Test Crane/Hoist

Test Crane/Hoist at the beginning of each shift or prior to first use. Notify personnel in the area that the crane/hoist will be tested and to stay clear. Verify that crane/hoist is operable and the hook is free of obstructions and is not attached to a load. Test operating controls to ensure trolley, bridge, and hoist movements and brakes are properly adjusted.

## 16.18 Load Movement

When traveling, sound alarm frequently if not automatically actuated. Suspended load must not pass over any individual or come in contact with equipment or other objects along the load path.

# WIRE ROPE

## 16.19 Wire Rope

### 16.19.1 Wire Rope Working Loads

Use only the wire rope recommended by the manufacturer. Ensure that the wire rope has the required certification paper detailing size, construction, type of lay, breaking strength and other pertinent information.

### 16.19.2 Wire Rope Inspection

Visually inspect all running ropes in use once every working day. Thoroughly inspect all ropes in use at least once a month.

Note any defects, such as those described below to determine whether using the wire rope would be unsafe.

- Rope diameter below nominal diameter because of:
    - Loss of core support
    - Internal or external corrosion
    - Stretch or wear of outside wires
- A number of broken outside wires, or inside valley wires, with large concentrations of broken wires distributed throughout.
- Worn outside wires.
- Corroded or broken wires at end connections.
- Corroded, cracked, bent, worn, or improperly applied end connections.
- Severe kinking, crushing, cutting, or evident of standing failure.

### 16.19.3 Wire Rope Replacement

If any of the following conditions exist, replace the wire rope:

- In running ropes, six or more randomly distributed broken wires in one lay or three or more broken wires in one strand in one lay. (One lay of wire rope is the distance along the wire rope in which one strand makes a complete revolution around the rope.)
- Wear of one-third of the original diameter of outside individual wires.
- Kinking, crushing, bird-caging, or any other damage that distorts the wire rope structure.
- Evidence of any heat damage.
- Nominal diameter reduced by more than:
    - 3/64 inch for diameters up to and including 3/4 inch.
    - 1/16 inch for diameters 7/8 inch to 1-1/8 inches.
    - 3/32 inch for diameters 1-1/4 inches to 1-1/2 inches.
- In standing ropes, more than two broken wires in one lay in sections beyond end connections.
- For any wire rope, one or more broken wires at an end connection. For this type of break, if the wire rope is long enough, cut off 6 to 8 feet of rope from the end connection and make a new connection.
- One or more broken wires in running rope, with breaks in the valleys between strands.

Exception: Wire rope, removed from service, may be used in non-critical applications such as tie downs, closing line for buckets, etc.

### 16.19.4 Wire Rope Handling

Handle wire rope as follows before and during installation:

- Store wire rope to prevent damage or deterioration and lubricate to prevent corrosion or rust.
- Unreel or uncoil wire rope as recommended by the rope manufacturer. Handle wire rope with care to avoid kinking or causing a twist.
- Before cutting a wire rope, place seizings on each side of the spot where the wire rope will be cut to prevent the strands from un-laying. Place the seizings as follows:
    - On preformed wire rope, place one seizing on each side of the cut.
    - On non-preformed wire ropes of 7/8-inch diameter or smaller, place two seizings on each side of the cut.
    - For non-preformed wire ropes 1 inch or larger, place three seizings on each side of the cut.
- During installation, avoid dragging the wire rope in dirt or around objects that will scrape, nick, crush or cause sharp bends in the wire rope.

### 16.19.5 Wire Rope Maintenance

Keep wire rope well lubricated to reduce internal friction and prevent corrosion. Verify that the lubricant is compatible with the original lubricant by consulting the wire rope manufacturer. When lubricating the wire rope, pay particular attention to sections of the wire rope located over sheaves or otherwise hidden during inspection and maintenance procedures. Periodic field lubrication is particularly important for non-rotating wire rope.

Minimize excess lubricant, which could cause safety or environmental hazards.

### 16.19.6 Drum Fastening

Securely fasten one end of the wire rope to the drum or reel. Do not allow the wire rope to fully unwind; at least two full turns must always remain on the drum or reel. Securely fasten the lifting or “dead” end of the wire rope to the block, device or reel with a tapered socket or an oval thimble.

### 16.19.7 Sockets, Clamps, and Thimbles

Use wire rope sockets on all hoisting lines at the bucket or hoist hook end, where facilities permit proper application. Otherwise, use the proper size of thimbles and apply:

- Three properly sized clamps on 3/4-inch wire ropes and under.
- Four clamps on 7/8-inch wire ropes.
- Five clamps on 1-inch to 1-1/4-inch wire ropes, inclusive.
- Six clamps on 1-3/8 inch and larger wire ropes. Make sure clamp spacing is no less than six times the diameter of the wire rope. Apply U-bolt over dead end of the wire rope. Live end of the wire rope rests in the saddle.

Clamps must be re-torqued a second time after lifting first load.

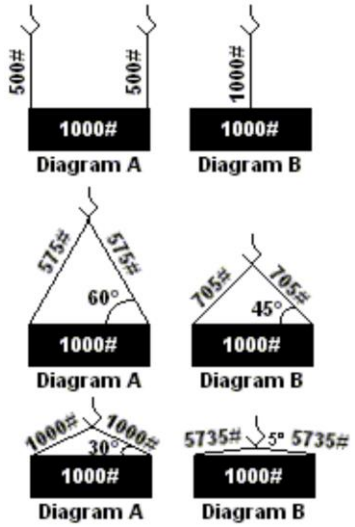
## Rigging

## 16.20 Rigging

Use slings, either wire rope, chain or synthetic fiber that are certified to handle the load.

While determining the strength of the sling, consider that the stress in a sling varies with the angle of its legs.

The following diagrams illustrate how the stress is increased as the angle of the legs with the horizontal is decreased. Stress for any other load will be directly proportional.



## 16.21 Fittings

### 16.21.1 Fitting Inspection

Fittings shall be inspected:

- upon purchase,
- prior to each use.

### 16.21.2 Fitting Replacement

Conditions such as the following are reasons for replacement:

- Any significant permanent deformation, or change in shape, indicates it has been overloaded.
- No more than 10% wear of any sectional dimension. This is measured by comparing to a section of fitting that has no wear, or to catalog dimensions.
- Any crack, sharp nick or gouge in the surface of any fitting.
- Any modification of any fitting is cause for removal from service. Welding or heating, substitution of parts and bending on any fitting are examples of modifications.
- More than one broken wire at any (within one wire rope diameter of the fitting) termination is cause for removal from service.

### 16.21.3 Hooks and Attachments

Non-alloyed carbon-steel hooks, repair links or other attachment must not be used. Homemade or makeshift bolts, rods, shackles, hooks or other attachments must not be used unless approved by department head. Handles and other attachments must not be welded to hooks. Hooks must be replaced if they have a twist of 10 degrees or more or a 15% increase in the throat opening.

Hooks equipped with safety latches must have them in place prior to use.

Dye penetrant or equivalent testing must be conducted on crane hooks annually.

## 16.22 Wire Rope Slings

### 16.22.1 Wire Rope Sling Inspection

Inspect wire rope slings prior to each use. In addition, a periodic inspection shall be performed by a designated person and shall include a record of the inspection. Inspection shall look for:

- distortions of the wire rope in the sling such as kinking, crushing, un-stranding, “bird caging”, main strand displacement or core protrusion,
- general corrosion,
- broken or cut strands,
- number, distribution and type of visible broken wires,

- loss of wire rope diameter in short rope lengths or unevenness of outer strands.

### 16.22.2 Wire Rope Sling Replacement

Conditions such as the following are reasons for replacement:

- For strand laid and single part slings ten randomly distributed broken wires in one wire rope lay, or five broken wires in one rope strand in one rope lay.
- Severe localized abrasion or scraping.
- Kinking, crushing, "bird caging", or any damage resulting in distortion of the wire rope structure.
- Evidence of heat damage.
- End attachments that are cracked, deformed or worn to the extent that the strength of the sling is substantially affected.
- Severe corrosion of the wire rope or end attachments.

## 16.23 Chain Slings and Chain

### 16.23.1 Chain Inspection/Replacement

Check chain and attachments prior to each use. Conditions such as the following are reasons for replacement:

- Wear, nicks, cracks, breaks, gouges, bends and weld splatter.
- Elongation: must not exceed 15%.
- Discoloration from excessive temperature and throat openings of hooks.
- Chain links and attachments do not hinge freely to adjacent links.
- Latches on hooks, if present, do not hinge freely, seat properly or are permanently distorted.
- Missing or unreadable sling identification tag.

### 16.23.2 Chain Working Loads

Grade 80 or above high-strength alloy is the only chain to be used for lifting, hoisting, pulling or any other load bearing application; unless the chain is supplied and certified by a manufacturer as a part of a manufactured device, i.e., a lifting sling, chain hoist, etc.

### 16.23.3 Chain Lifting Devices

All lifting devices, such as hooks, links, pins, etc., must be made of alloy steel. Do not use lifting devices made of mild steel or rolled steel under any circumstances.

### 16.23.4 Chain Use

To avoid personal injury or chain damage:

- Keep chains free of twists, kinks or knots and make sure grab hooks fit the chain and are placed on the hitch so that no side strain occurs during the lift.
- Do not impact load or jerk chain. Apply load slowly.
- Protect chain from sharp corners and objects. Protect chain from corrosion and high temperature.
- Do not use “patent links,” “repair links,” or “figure eight” links when repairing lifting chains.

### 16.23.5 Chain Lubrications

Lubricate chains as required when operating them over sheaves or pulleys. Use an approved lubricant to ensure maximum chain life. Minimize excess dripping of lubricant.

## 16.24 Synthetic Slings

### 16.24.1 Synthetic Sling Inspection

Inspect synthetic slings prior to each use. In addition, a periodic inspection shall be performed by a designated person and shall include a record of the inspection.

### 16.24.2 Synthetic Sling Replacement

Conditions such as the following are reasons for replacement:

- acid or caustic burns,
- melting or charring of any part of the sling,
- tears, cuts, or snags,
- broken or worn stitching in load bearing splices,
- excessive abrasive wear,
- knots in any part of the sling or slings tied together,
- excessive pitting or corrosion, or cracked, distorted or broken fittings,
- other visible damage that causes doubt as to the strength of the sling,
- missing or unreadable sling identification.

## 16.25 Webbing and Round Slings

All of the fibers in a webbing sling are load bearing. In a round sling, the load bearing fibers are “wound” within a protective jacket. The protective jackets are not load bearing and protect the load bearing fibers. Do not bunch or pinch the sling in fittings.

Conditions such as the following are reasons for replacement:

- missing or unreadable tags,
- melting, charring or weld splatter of any part of round sling,
- holes, tears, cuts, embedded particles, abrasive wear, or snags that expose the core fiber,
- broken or worn stitching in the cover which exposes the core fibers.

## 16.26 Eye Bolts and Hoist Rings

The use of eye bolts at the load connection causes the horizontal sling angle to become smaller as the loads on each leg and each eye bolt increases. As the eye bolt becomes side loaded, the eye bolt loses strength. Select the proper size swivel hoist ring to allow for load in sling leg. Follow these guidelines:

- do not exceed working load limits,
- do not use regular nut eye bolts for angular lifts,
- always use shoulder nut eye bolts for angular lifts,
- always tighten nuts securely against the load,
- always apply load to eye bolt in the plane of the eye,
- when using lifting slings of two or more legs make sure the forces in the leg are calculated.

## 16.27 Ropes and Come Alongs

Inspect all manila, hemp, or synthetic fiber ropes before they are used for lifting. Remove any frayed, cut, or defective rope from service immediately.

When using a Come Along, ensure that the hooks are not sprung/bent or the handle bent or chain shows signs of stress or broken links.

Make sure hooks are properly seated before applying pressure.

Be cautious as to not exert excessive force on the Come Along causing the hooks or chain to break.

# 17.0 ELECTRICAL

## 17.1 Authorized Employees

Only authorized employees are permitted to:

- work on electrical apparatus of equipment,
- work on lines or equipment energized in excess of 50 volts' phase to ground.

## 17.2 Electrical Cords

Inspect electrical cords and make sure they are in good condition and have a ground. Follow these guidelines for using cords:

- Use cords in an approved manner.
- Electric power tools must not be picked up or lowered by the power cord.
- Do not remove the grounding prong.
- Do not overload electrical outlets.

## 17.3 Electrical Panels

In shop areas, the floor area in front of electrical control boxes must be kept clear of any obstruction.

Circuit breakers must be properly labeled as to the circuit controlled.

## 17.4 Voltage Rated Rubber Gloves

Wear voltage rated rubber gloves when working on energized circuits of 300 volts or more. Gloves must be tested before use by inflating with air. If there are any leaks, a glove finger must be removed so the glove cannot be used.

## 17.5 Shorting Electrical Circuits

Use only approved non-metallic cased flashlights around electrical equipment. Conductive articles of jewelry and clothing must not be worn in locations with exposed energized parts. Examples of conductive articles are metal watches, rings, bracelets, metal headgear or clothing with conductive thread.

## 17.6 Working Near Power Lines

| Operating Voltage | Distance In Feet |
|---|---|
| 0-5000 | 4 |
| 5,000 -15,500 | 6 |
| 15,500 – 25,000 | 7 ½ |
| 25,000 – 35,000 | 9 |
| 35,000 – 50,000 | 12 |

When performing work near electrical power lines, the clearance shown below must be maintained between personnel, their tools and equipment, and the nearest power line. When booms are used in the vicinity of power lines, Rule 17.7, Booms Near Power Lines, applies.

Note: For voltages over 50,000 volts, add 1.2 inch for each KV (1,000 volts.)

### 17.6.1 Measuring Overhead Clearance

A qualified person is required to measure overhead clearances using the proper instruments. Do not use steel or cloth tapes, ropes or strings to measure overhead clearance.

## 17.7 Booms Near Power Lines

Do not operate booms over power lines at any time. Do not operate them under power lines unless proper clearance is maintained.

Note: If proper clearance cannot be maintained, see 17.8, Power Supply Turned Off.

### 17.7.1 Proper Clearances

If booms must be operated near energized lines, the following clearances must be maintained:

- Lines rated 50 KV (50,000 Volts) or less, minimum clearance between the lines and any part of the crane or load must be 10 feet.
- Lines rated over 50 KV (50,000 Volts) and less than 170 KV (170,000 Volts), minimum clearance between the lines and any part of the crane or load must be 15 feet.
- Lines rated over 170 KV (170,000 Volts), minimum clearance between the lines and any part of the crane or load must be 15 feet plus 1/2 inch per KV in excess of 170 KV (170,000 Volts).
- When in transit, with no load and boom lowered, the equipment clearance must be a minimum of 8 feet for voltages less than 15 KV and 10 feet for voltages 15 to 50 KV. For voltages 50 to 470 KV, the clearance must be increased 1/2 inch per KV in excess of 50 KV.

A ground man must be designated to observe equipment clearance and give timely warning for all operations when it is difficult for the operator to observe clearance.

Note: See Rule 16.4, Ground Man.

### 17.7.2 Stationary Worksites

At stationary worksites, crane operators must place at least three orange cones along the minimum clearance line to mark the minimum safe working distance to overhead power lines.

## 17.8 Power Supply Turned Off

When necessary to perform work that will not permit maintaining the clearance outlined in the previous rules, notify the power company or controlling authority and have them turn off the power supply for the affected district. Do not start any work until authorized by the power company or controlling authority. Do not turn the power back on until authorized by a supervisor.

When performing work near a 2,400-volt or greater signal line that will not permit the clearance outlined, notify the signalman to switch the power off to that portion of line. Do not start work until the signalman says that the power has been switched off. Make sure the signalman understands not to switch power on again until advised by the supervisor in charge of the work.

If the power must be switched off, equipment must be kept at least one half the clearance distance indicated, but in no case may the clearance be less than 4 feet.

## 17.9 Handling Electrical Wires

Immediately report electrical wires found broken, crossed or on the ground to the train dispatcher or proper authority. Do not consider any electrical wire dead until positive information has been received that it has been de-energized and is safe to handle. If an emergency requires an employee to separate live electrical wires, the employee must be able to grab onto a dry hand line or other dry rope while standing on a dry board or pole and must not get closer than 5 feet to the electrical wire being handled.

## 17.10 Lockout/Tag Out

Lockout or tag out a disconnected electrical switch before doing maintenance or repair work. Do not remove warning signs or blocks placed on locks by other employees or close any switch so protected, unless authorized to do so by the employee(s) who placed it there for his or her protection.

# 18.0 WELDING

## Cutting, Welding or Heating

## 18.00 WELDING continued



## Electrical Welding

# 18.0 Welding

## Cutting, Welding or Heating

Rules in this chapter, if applicable, apply to both oxygen and fuel gas operations as well as electric welding.

## 18.1 Authorized Employees

Only qualified employees are permitted to use welding equipment. Welding, cutting and heating will be done only by or under the direct supervision of a qualified employee and comply with manufacturer's instructions.

## 18.2 Protective Equipment

### 18.2.1 Eye Precautions

All persons performing or observing cutting, welding or heating operations must wear proper eye protection and other personal protective equipment. They must not look at electric arc or oxy-fuel flame unless properly protected and must warn others against looking at the arc or flames.

| Welding | Shade No. |
|---|---|
| Shielded Metal – Arc – Welding – Electrodes up to and including 5/32-inch diameter. | 10 |
| Gas Tungsten – Arc Welding (non-ferrous) and Gas-shielded Arc Welding (non-ferrious) – Electrodes up to and including 5/32-inch diameter. | 11 |
| Gas Tungsten – Arc Welding ferrous) and Gas-shielded Arc Welding (ferrous) – Electrodes up to and including 5/32-inch diameter. | 12 |
| Shielded Metal – Arc Welding: Electrodes<br>3/16 through 1/4-inch diameter<br>5/16 through 3/8-inch diameter | <br>12<br>14 |
| Carbon – Arc Gougeing – For most application<br>Large diameter carbon electrodes | 12<br>14 |
| Soldering | 2 |
| Performing oxygen – fuel gas brazing – cutting – heating | 5 |
| Light cutting up to 1 inch | 4 |
| Medium cutting, 1 to 6 inches | 5 |
| Heavy cutting, 6 inches and over | 5 or 6 |

| | |
|---|---|
| Gas Welding (light) up to 1/9 inch | 5 |
| Gas Welding (medium) 1/8 to 1/2 inch | 5 or 6 |
| Gas Welding (heavy) 1/2 inch and over | 6 or 8 |

Refer to the following chart for minimum shade requirements of eye protection while cutting or welding.

Cracked filter glasses (lens shade) must be replaced immediately. Shade number of filter plates are not additive. For example, a Number 6 and Number 8 filter do not have the same effective density as a Number 14 filter.

Note: See Rule 11.5.2, Additional Eye Protection Requirements.

### 18.2.2 Shielding

Welders must shield the welding arc from the view of others whenever possible.

### 18.2.3 Proper Clothing

When cutting, heating or welding wear hearing protection, high top boots, leather welding gloves or leather welding mittens and flame resistant clothing. When performing overhead electric arc or oxy/ fuel operations wear a full leather welding jacket.

Always wear flame resistant clothing. Flame resistant clothing should not be synthetic, synthetic blends such as nylon, rayon, polyester, etc. Clothing should protect the skin from infrared and ultraviolet radiation, as well as reduce the possibility of it catching fire or melting from hot sparks or hot slag.

Additional protective outerwear such as leather aprons, leather leggings, spats or sleeves shall be worn for overhead welding and for any other applications where clothing or body is in danger of being exposed to sparks or hot slag.

Kevlar jacket or Kevlar jacket with leather sleeves may be worn for lightweight cutting or welding and are not intended for overhead welding. Arms must be covered; tee shirts are not acceptable.

All buttons on jackets must be buttoned. Sleeves and pockets must be secured against sparks or hot slag. Clothing must be free of oil or grease and trousers or overalls must be without cuffs.

Do not carry cigarette lighters or matches where they may be exposed to sparks or excessive heat.

### 18.2.4 Cleaning Work Area

Do not use your hands, whether gloved or not, to brush slag or metal from material being welded or cut.

## 18.3 Fire Protection

Use shields or other protective devices to prevent setting fire to or damaging bridges, structures, or other material. Fire extinguishers, fire hose or other suitable fire extinguishing equipment must be on hand during welding, cutting, and other open flame torch operations.

### 18.3.1 Protecting Area

Before leaving the work site, the person in charge must check to see that no fire or fire hazard exists. If a potential fire hazard exists, the worker in charge must assign a watchman equipped with a fire extinguisher or ample water supply to stay in the area for a minimum of 2 hours after the last weld is completed.

### 18.3.2 Welding, Heating or Cutting on Freight Cars

When welding, heating or cutting on freight cars (all types):

1. A thorough job briefing must be conducted before work is started to include what the car contains, or last contained if empty, and any special safety precautions needed to perform the required work.
2. Prior to working on a car, a fire extinguisher of the proper class must be in the immediate vicinity of the work.
3. Care must be taken to ensure lading or equipment is not damaged by the work.
4. Where repairs to the car include welding, heating or cutting and before leaving the worksite, it must be known that no fire exists. Re-check cars that have received welding or burning earlier in the shift. Make turnover to subsequent shifts of cars that have received welding, heating or cutting.
5. Welding, heating or cutting should be held to that which is necessary to meet the company, FRA and AAR criteria for safety and interchange ability.
6. If required, adequate ventilation and/or respiratory equipment must be provided.
7. When welding, heating or cutting on a car, the car must be continuously monitored until no threat of fire exists.
8. Ensure cars are set on their trucks at the close of work, whenever possible.
9. Cars that are subject to welding, heating or cutting should be placed at the end of the shop, when possible.
10. All cars that have had welding, heating or cutting and will stay under shop roof should have the doors closed.
11. If feasible, stop welding, heating or cutting 30 minutes before close of shift.
12. In the event of a freight car fire, if possible, without causing injury, car doors should be closed and car moved outside shop to be extinguished.
13. Extinguish fire only if injury can be prevented. Contact local emergency authorities, if necessary, to safely extinguish fires.

### 18.3.3 Welding, Cutting or Heating on Tank Cars

When making repairs to tank cars, other than maintenance of way water cars, follow precautions outlined in Rule 18.3.2, Welding, Heating or Cutting on Freight Cars.

In addition, follow these procedures:

1. Determine car's contents, or if empty, it's last contents.
2. Consult the hazardous material information, or information available on precautions to be taken with the material involved. Comply with those instructions.
3. Prior to performing any repairs that require welding, cutting, or heating on a tank car that contains or last contained flammable gas, flammable liquid, flammable solid poison gas, chlorine, corrosives or explosives, the car will be inspected for physical signs of content leakage. If leakage exists, follow procedures outlined in your response plan and Rule 10.20, Chemical Spills. Leakage must be stopped before making repairs.
4. Repairs to the top dome areas or near the bottom outlet must be restricted to those necessary for safe movement only. Welding, cutting and/or heating is not permitted in these areas. Welding or use of a cutting torch directly on either the inner or outer tank shell jacket is prohibited as well, unless departmental instructions make provisions for such work.
5. These instructions apply to tank cars that are in close proximity to welding or torch burning repairs being performed on other equipment.

## 18.4 Repairs or Alterations

Do not make repairs or alterations to cylinders, valves or torches. Defective regulators, torches or other equipment must not be used and must be returned to designated point for repair. Hose showing leaks, burns, worn places, evidence of damage from flashback or other defects must be replaced.

## 18.5 Equipment Condition

Inspect all equipment and know it is free of defects and in proper working condition.

Torch test must be conducted:

- prior to initial use each day or shift,
- when combination torches have been converted or altered,
- when the torch equipment has been dropped or is suspected of being damaged,
- when a flashback has occurred.

Torch test must be conducted in a well ventilated area with no ignition sources present.

Test will be conducted in accordance with departmental instruction.

### 18.5.1 Acetylene Torch Regulator Pressure

Do not allow operating hose pressure to exceed 15 psi at any time.

## 18.6 Ventilation

Work in areas that have ventilation.

When working in a building or in a confined space, place fuel-driven welding machines where exhaust fumes can be safely dissipated. Make certain that the exhaust fumes are not directed toward or into air intake parts on ventilation systems or air supplying equipment (e.g., compressors).

## 18.7 Hot Work

Do not weld, grind, rivet, solder, or cut on any new or used piston heads, hollow casting, or containers such as drums, barrels, or tanks until the following conditions have been met:

1. Determine what the container last held. Thoroughly steam and wash out any container that held volatile or flammable materials.
2. Prior to grinding, heating, cutting or welding on any new or used container, trained personnel, using a Combustible Gas Indicator, will test the containers. The LEL must be <10% prior to and during any hot work activity.
3. After thoroughly cleaning, remove plugs or caps and further safeguard the container by filling it with water, if possible, before performing any welding, cutting, soldering or open flame work. In addition, if the container last held a gas or liquid which may not readily dissolve in water, an inert gas should be used to evacuate any flammable gas or vapors from the container. Ensure that the container has a vent or opening to allow heated air to escape.

## 18.8 Use of Oxygen

Oxygen must not be used for compressed air as a source of pressure or to “dust” clothing.

## 18.9 Oil and Grease

Keep hands, gloves, and clothes, as well as welding equipment, free of oil and grease to prevent fires.

Do not allow oil and grease to touch regulators, valves or connections.

## 18.10 Hot Metal Precautions

When cutting, take precautions, such as barrier or spark guard, to prevent sparks, hot metal or severed sections from contacting cylinders, hose, cable or other flammable material. Do not lay object or material to be heated, cut or welded across a cylinder or on concrete.

## 18.11 Exposure to Excessive Heat

Do not allow cylinders to be exposed to sparks, hot slag, open flame and other sources of excessive heat.

## 18.12 Cutting Under Tension

When cutting twisted rail or other damaged steel sections, take precautions to prevent personnel from being struck by severed sections. Special equipment, such as burning bars, are available for this operation and should be used.

## 18.13 Cylinders

### 18.13.1 Storing Cylinders

When storing fuel gas and oxygen cylinders:

- Handle cylinders with extreme caution to avoid dropping and damaging valves.
- Separate oxygen cylinders from fuel gas cylinders. Maintain a minimum distance of 20 feet or place a barrier of noncombustible material that is at least 5 feet high and has a fire resistance rating of at least 30 minutes between the oxygen and fuel gas cylinders.
- Store fuel gas or oxygen cylinders in upright positions on approved racks and properly secured. Keep valve ends up. Cylinders must be secured, whether they are being transported or put in storage. Store oxygen cylinders separate from fuel gas cylinders.
- Store cylinders in cool, well ventilated buildings away from elevators, stairs and passageways, when possible. Place them near exits for easy removal in case of fire.
- Store cylinders in the open when the cylinders can be protected against freezing or direct sunlight.
- Do not smoke or use matches or open-flame lights or torches in buildings where cylinders are stored. NO SMOKING and KEEP OPEN LIGHTS AND FIRES AWAY signs must be posted on all visible sides.
- When not in use, all outlet valves should be kept tightly closed, even though cylinders are considered empty. Valve caps must be kept in place.
- Fuel gas and oxygen cylinders, connections and appliances must be kept free from oils and greases. Do not handle cylinders with oily hands or gloves. Keep the cylinders away from combustible materials (e.g., oils, paints, shavings, and other flammable materials).

### 18.13.2 Working with Cylinders

When working with cylinders:

- Do not place cylinders where they may become part of an electrical circuit. Avoid placing cylinders near wires and electrical welding circuits.
- Do not strike an arc on or tap an electrode against a cylinder.
- Fuel gas and oxygen cylinders must be used in an upright position.
- Do not throw, drop or otherwise roughly handle cylinders.

Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

Do not use an electric magnet to lift cylinders.

### 18.13.3 Transporting Cylinders

Remove gauges and regulators and apply caps before transporting oxygen or fuel gas cylinders, unless valves are covered by a DOT approved safety cap or device designed for that purpose. Caps need not be applied to complete a single series of welding operations.

When carrying oxygen cylinders in tool cars or in isolated compartments, make sure ventilation is provided.

### 18.13.4 Empty Cylinders

When cylinders become empty:

- Close the cylinder valve before disconnecting the hose. Valves must remain closed when cylinders are not in use.
- Cap empty cylinders when a cap is provided.
- Tear off the bottom half of the tag when provided (red on acetylene cylinders, green on oxygen cylinders).
- Separate empty cylinders from full cylinders.
- Promptly exchange empty cylinders at the supply point.

### 18.13.5 Leaking Cylinder

When a leaking cylinder is discovered, move it to an open area away from possible sources of ignition until the cylinder becomes empty.

Mark the cylinder, indicating the defect, so the supplier can take necessary corrective action.

### 18.13.6 Changing Cylinders

Before a regulator is removed from a cylinder valve, the cylinder valve must be closed and the gas released from the regulator. Drain both hoses, oxygen side first, in order to remove any possible gas mixture.

## 18.14 Regulators

### 18.14.1 Proper Regulator

Do not use a regulator with a gas not intended for that regulator. Each oxygen/fuel gas station must have a shut off valve and be controlled with a pressure reducing regulator to obtain the recommended test pressures. Regulators must have operable gauges.

Regulators without gauges are not approved for service and provide no means to check pressures.

### 18.14.2 Connections and Adapters

Do not force connections. If the thread does not run easily, usually the wrong sized regulator is being applied. Use a standard adapter between the cylinder and the regulator if required. “Tee” or “Y” type connectors are not allowed.

### 18.14.3 Connecting Regulators

Before connecting regulators to cylinders, welders must crack the cylinder valve slightly to blow out any foreign matter. The valve should be opened approximately one-quarter of a turn and closed immediately.

Do not open a fuel gas valve near other welding work or near sparks, flame or other possible sources of ignition.

### 18.14.4 Protecting Regulators

Protect regulators when not in use by first closing cylinder valves, draining hoses at the torch, then releasing pressure on the diaphragm. Prevent a gas mixture from accumulating in the hose when either is being relieved of pressure by closing the valve of the other hose. This will prevent flashback which could damage the torch, hose or pressure regulator.

## 18.15 Valves

### 18.15.1 Opening Cylinder Valves

Pressure adjusting screws must be fully released before attaching regulator to cylinder. When opening a cylinder valve, stand to one side, away from the gauge faces and the front of the regulator. Wrenches or other tools which damage regulator connections must not be used. Where a special wrench is required, it must be left in position on the stem of the valve while the cylinder is in use, so that the fuel gas flow can be quickly turned off in case of emergency.

Return the cylinder to the vendor if oxygen valve cannot be opened by hand. Do not use hammer or wrench to open an oxygen cylinder valve.

Oxygen Cylinder Valve
Slowly open the oxygen cylinder valve until the high-pressure gauge indicates full pressure. Then fully open the valve.

Acetylene Cylinder Valve
Do not open an acetylene cylinder valve more than 1 ½ turns. Leave the T wrench on the acetylene cylinder valve stem in case an emergency arises.

Do not use the recessed top of a cylinder as a receptacle for tools or other articles, since this might damage the safety plugs or interfere with closing the valve quickly.

### 18.15.2 Closing Valves
Valves of cylinders and stations on piped and manifold systems must be closed when not in use. When work is stopped or completed, or when the operator leaves the equipment, valves must be operated to relieve pressure on regulators and hoses.

### 18.15.3 Clogged Valves
If acetylene cylinder valves become clogged by ice or snow, use warm or medium hot water to thaw them. Do not use boiling water, since it may loosen fusible plugs. Do not use any type of flame to thaw acetylene cylinder valves.

### 18.15.4 Torch Valves
Make sure torch valves are open when changing or adjusting pressure on regulators. Do not exceed pressure authorized for welding or cutting.

## 18.16 Hoses
When using oxy-fuel equipment, use only equipment designed for the particular fuel gas being used. When not in use, oxygen and fuel gas hoses must be properly stored to prevent damage.

### 18.16.1 Hoses and Color Codes
Oxygen-fuel gas hoses must be inspected prior to each use. Hose(s) showing leaks, worn places or other defects must be repaired or replaced.

Long lengths of hose are not desirable. When long lengths are necessary, all connections must be tight and hose must be protected from being stepped on, run over, kinked or tangled.

When lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, not more than 4 inches out of 12 inches shall be covered by tape.

Use T-Grade welding hose for welding. Where possible, 3/8-inch hose will be used to reduce pressure drop. Color codes for hose are:

- Red – Combustible Gases
- Green - Oxygen

Hose must be used only with the gases for which it is intended. Do not interchange hose or use it for other purposes.

### 18.16.2 Hose Connections

Blow out new hose, with gas for which the hose will be used, to remove talc. In making up hose connections, only crimp ferrules will be used and no more than two splices will be used for any length hose. Tape or wire will not be used to repair hose. Approved reverse flow devices must be used. Quick disconnect may be used and must be positive locking and approved for oxy-fuel use only.

## 18.17 Torches

Torches must be maintained in good condition and carefully handled. Use proper torch and tips designed for the fuel gas (Acetylene, Natural Gas, MAPP, Propylene). A lighted torch must not be laid down, passed from one person to another, or kept in your hand when climbing. When not in use, valves must be closed and torch stored in a safe place.

### 18.17.1 Torch Precautions

When working with torches:

- Make sure that the gas stream is not directed toward yourself or others.
- Keep the flame and sparks directed away from personnel, flammables, and equipment.
- Torch should be momentarily purged prior to lighting to ensure flow of oxygen and fuel gas.

Do not use the torch as a hammer.

### 18.17.2 Lighters

Use a standard friction lighter to ignite all oxygen fuel gas equipment or fuel gas equipment. Do not use matches or other means to ignite a blow pipe.

### 18.17.3 Shutting Down Torch Regulators

When shutting down torches, the following procedure must be followed:

Shut Down:

1) Close both control valves on the supply tanks
2) Bleed off existing pressure in both lines via torch handle
3) Unscrew the pressure setting T Handles on both regulators.

### 18.17.4 Start Up of Torch Regulators

1) Check to see that both regulator pressure T handles have been loosened.
2) Check valves on torch handles to make sure they are closed.
3) Open supply tank valves slowly.
4) Set operating pressures using the T Handles on regulators.

# Electrical Welding

## 18.18 Maintenance and Repair

Only a qualified mechanic or electrician may make repairs or adjustments to electrical welding equipment.

EXCEPTION: Welders may make routine operating adjustments.

## 18.19 Cable Insulation

Make sure electrode and ground cables are completely insulated throughout their entire length. Do not allow the welding cable to contact or be pulled through pools of water or dip the electrode holder into water for cooling.

## 18.20 Cable Connection

Use approved cable connections with insulated covering. Cables must be in continuous lengths without splices or taps.

Use correct cable size. Sustained overloading will cause cable failure and result in possible electrical shock or fire hazard. Ground cable should be the same rating as the electrode cable.

When repairing cables or cable ends, disconnect the cable at the first joint. Coil the cable to ensure that it cannot be reconnected while repairs are in progress.

## 18.21 Portable Welding Machines

Power supply cables to portable welding machines must include a conductor for grounding protection. One end of this conductor must be connected to the machine frame. The supply end must be connected to a suitable grounding connection (e.g., underground piping system or a copper-coated ground rod).

Set the disconnect switch to the OFF position before plugging or unplugging welding machines.

## 18.22 Grounding Electrical Arc Welding

When performing electrical arc welding on machinery or equipment of any kind, apply the ground cable to the particular part or piece of machinery or equipment being welded and as near as possible to the point being welded.

Note: Ground cable clamps must provide good mechanical and electrical contacts with enough carrying capacity to handle welding current without undue heating.

Do not permanently bond the welding ground lead to any rail, building steel, or other structure.

Do not make a welding ground connection in such a way that welding current will pass through any type of machined bearing.

Fixed electrical welding equipment must be permanently grounded on the service side to the ground system.

1. Prior to working on a car, a fire extinguisher of the proper class must be in the immediate vicinity of the work.
2. Care must be taken to ensure lading or equipment is not damaged by the work.
3. Where repairs to the car include welding, heating or cutting and before leaving the worksite, it must be known that no fire exists. Re-check cars that have received welding or burning earlier in the shift. Make turnover to subsequent shifts of cars that have received welding, heating or cutting.
4. Welding, heating or cutting should be held to that which is necessary to meet the company, FRA and AAR criteria for safety and interchange ability.
5. Adequate ventilation must be provided.
6. When welding, heating or cutting on a loaded boxcar, the door must be open and interior of car continuously monitored until no threat of fire exists.
7. Ensure cars are set on their trucks at the close of work, whenever possible.
8. Cars that are subject to welding, heating or cutting should be placed at the end of the shop, when possible.
9. All cars that have had welding, heating or cutting and will stay under shop roof should have the doors closed.
10. Stop welding, heating or cutting 1/2 hour (30 minutes) before close of shift.
11. In the event of a freight car fire, if possible, without causing injury, car doors should be closed and car moved outside shop to be extinguished.
12. Extinguish fire only if injury can be prevented. Contact local emergency authorities, if necessary, to safely extinguish fires.

### 18.22.1 Welding, Cutting or Heating on Tank Cars

When making repairs to tank cars, other than maintenance of way water cars, follow precautions outlined in Rule 18.3.2, Welding, Heating or Cutting on Freight Cars. Also follow departmental policy, and other applicable policies, i.e., Confined Space Entry, Respiratory Protection, Hazard Communication Standard, etc. In addition, follow these procedures:

1. Determine car's contents, or if empty, it's last contents.
2. Consult the hazardous material information, or information available on precautions to be taken with the material involved. Comply with those instructions.
3. Prior to performing any repairs that require welding, cutting, or heating on a tank car that contains or last contained flammable gas, flammable liquid, flammable solid poison gas, chlorine, corrosives or explosives; the car will be inspected for physical signs of content leakage, and checked with a flammable gas detector. If leakage exists, follow procedures outlined in your response plan and Rule 10.20, Chemical Spills. Leakage must be stopped

before making repairs.

4. Repairs to the top dome areas or near the bottom outlet must be restricted to those necessary for safe movement only. Welding, cutting and/or heating is not permitted in these areas. Welding or use of a cutting torch directly on either the inner or outer tank shell jacket is prohibited as well, unless departmental instructions make provisions for such work.
5. These instructions apply to tank cars that are in close proximity to welding or torch burning repairs being performed on other equipment.

## 18.23 Protect from Electrical Shock and Moisture

Protect yourself from possible dangerous electrical shock. The electrode and work (or ground) circuits are electrically "hot" when the welder is on.

- Do not permit contact between "hot" parts of the circuits and bare skin or wet clothing.
- Do not simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- Wear dry, hole-free, approved welding gloves to insulate hands.
- Insulate yourself from the work and ground by using dry insulation.
- When welding in damp locations, on metal floors, grating or scaffolds, and when in positions (such as sitting or lying), make certain the insulation is large enough to cover your full area of physical contact with the work and ground.
- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.
- When using the welding machine as a power source for mechanized welding, the above precautions also apply for the welding wire, wire reel, welding head or nozzle.
- When working above floor level, protect yourself from a fall should you be shocked.
- Do not loop or coil electrode cables around the body.
- During inclement weather, electrical welding equipment must be properly protected from moisture. Electric welding machines that have become wet, must be thoroughly dried and tested before being used.

## 18.24 Electrodes

When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

Electrodes must be removed from their holders when not in use. Holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

Electrodes must be stored where they can be kept free of moisture.

## 18.25 Polarity Switch

Welding machine must not be changed while it is operating under welding current load.

## 18.26 Thermite Welding

Only authorized employees are permitted to perform thermite welding. During the thermite welding process:

- Wear goggles and face shield while making the pour. One form of eye protection must have a number 5 lens or greater. Any employee within 15 feet of the weld being poured must wear a face shield with safety glasses at all times.
- Goggles or face shield with safety glasses must be worn when removing the mold and cleaning the weld.
- Do not dump hot slag on wet soil, snow or throw in water.
- Waste slag must be properly disposed of by burying.

# 19.0 WALKING/WORKING SURFACES

# Walking/Working Surfaces

## 19.1 Avoiding Slips, Trips and Falls

Observe safety practices that eliminate slips, trips and falls.

- Perform your work to avoid creating hazards.
- Maintain good housekeeping.
- Clean up spills.
- Erect barricades, signs, or cones where appropriate.
- Avoid objects, obstructions, holes and openings and be alert to underfoot conditions. Aisles, stairways and walkways must be kept free of tools, trucks, materials, equipment and obstructions.
- Covers for drop pits, manholes, and other openings must be kept in place when not in use.

## 19.2 Precautions Against Slips, Trips, and Falls

Take precautions to avoid slipping on:

- Slick surfaces such as recently washed or waxed floors, oil, grease or soap on the walkway.
- Snow, ice, wet spots or other hazards caused by inclement weather. Use appropriate footwear and accessories and/or spread sand/salt mixture (as appropriate) on ice before proceeding when icy conditions exist.
- Use oil dry, sand, or other types of anti-slip material on oil or other slippery substances left on floors or walkways.

When walking, keep your eyes on the pathway and if hazardous under foot conditions exist:

- Keep your hands out of pockets for balance.
- Take short, deliberate steps with toes pointed outward.
- When stepping over objects, such as rails, be sure your front foot is flat before moving your rear foot.

Employees are prohibited from running except when necessary to prevent injury to themselves or others.

## 19.3 Stairs

Do not run up or down stairs, through halls or passageways, or around corners. Do not ascend or descend stairways with hands in pockets and use the handrail where provided.

## 19.4 Look Both Directions

Look in both directions and know the way is clear when walking out of doorways or going around corners or obstructions.

## 19.5 Jumping

Do not jump from equipment or structures such as docks, trucks, rail cars, platforms, etc. or across ditches, pits, manholes or other openings.

## 19.6 Working at Night or Low Light Level

Carry a light, or use additional lighting, when working at night or where there is a low or inadequate level of lighting. Exercise care to avoid hazards caused by shadows resulting from the use of lights.

Trainmen and yardmen must use a railroad-approved lantern, or an approved device designed for use in RCL operations that is attached to their body. Locomotive engineers must use a railroad approved lantern or a non-metallic flashlight.

## 19.7 Conveyors

Do not ride on or step across conveyors.

## 19.8 Safe Distance from Edge

Keep a safe distance from the edge of pits, turntables, platforms or trenches. Exercise caution when working on or near steep slopes.

## 19.9 Turntables

Do not get on or off moving turntables or transfer tables.

## 19.10 Overhead Hazards

Avoid overhead hazards and do not work, walk or stand under workmen, ladders, platforms or scaffolds from which objects could fall. If required to work under overhead hazards, wear the proper protective equipment (e.g., hard hats).

## 19.11 Approved Ladders

Use only single person ladders which are rated 1A (300 lb. rating) or 1AA (375 lb. rating). Standing on boxes, barrels, chairs or other improvised supports is prohibited. Only equipment approved for this purpose may be used. Stepladders that are two sided and can accommodate two people at one time must have a minimum total capacity rating of 500 pounds.

Ladders or specially designed platforms are required to service, maintain or repair elevated locations on locomotives. Do not stand on locomotive handrails.

## 19.12 Inspection

Before a ladder, scaffold, platform or elevated board is used, check to ensure that it is securely placed and capable of supporting the load. Before using a ladder, inspect it for broken or missing steps, rungs, cleats, broken side rails or other defects. Do not use a defective ladder. Defective ladders must be removed from service and tagged, "OUT OF SERVICE."

Before using a portable ladder, inspect it for defects and ensure that it is equipped with spikes or nonslip feet suitable for the surface on which it will be used.

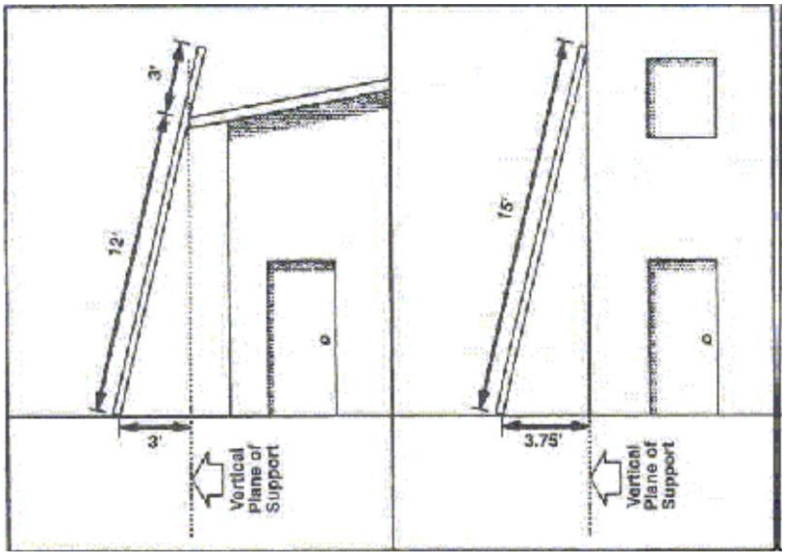
Portable ladders that are used in areas where they could contact exposed energized parts must have nonconductive side rails.

## 19.13 Storage

Ladders and portable steps must be properly stored.

## 19.14 Placement

Place a straight ladder so that the horizontal distance from the base to the vertical plane of the support is approximately one-fourth the ladder length between the supports. When it is required to exit the top of the ladder, the ladder side rails must extend at least three feet above the top landing, eaves, gutter or roof. Place ladder legs on firm footing and secure against movement. Do not lean a ladder against an unstable object or place on a box, barrel, block or other unstable base for additional height. Ladders must be secured to prevent movement. Do not use a ladder in a horizontal position as a runway or scaffold.



## 19.15 Extension Ladders

Assemble and carefully raise to ensure that guides and hooks are properly engaged. Use the ladder's rope to raise and lower the extension and keep hands and fingers clear of the moving portion.

## 19.16 Metal Ladders

Do not use metal ladders or scaffolds when working on or near energized electrical wires.

## 19.17 Ascending or Descending

Face ladder and use both hands when ascending or descending maintaining a three point contact. Only one person may be on a ladder at a time, unless it is designed for more than one person.

## 19.18 Near Doors and Aisles

Ladders used near a door, aisle, pathway or roadway must be secured or guarded.

## 19.19 Climbing with Tools/Material

Do not climb ladders with tools or materials in your hands. Tools may be carried in an approved tool belt or a hand line must be used. Tools or materials must not be placed on a scaffold or platform in such a manner that they may fall or be knocked off.

## 19.20 Step Ladders

A step ladder must not be used unless it is fully opened and the spreaders properly set. Step ladders more than 10 feet high must not be used unless held and steadied by another individual. Standing on the top step, platform or those parts of the ladder labeled "NO STEP" is prohibited.

## 19.21 Platforms

Platforms more than 6 feet above the ground or floor in construction operations or 4 feet in General Industry operations must have:

- guard rails with a nominal height of 42 inches.
- mid-rail at one-half the height distance of the top rail
- toe board of 4 inches nominal height on all open sides and ends.

## 19.22 Sectional Scaffolding

Sectional scaffolding must be erected in accordance with the manufacturer's instructions. Where such scaffolding is equipped with wheels for support, they must be equipped with wheel locks and locked before work is performed. Outriggers and toe boards, where provided, must be in working condition and protected from damage. Scaffolding legs must be placed on firm footing and secured against movement.

## 19.23 Fall Protection

Do not work on bridges, elevated structures or the roofs of cars and locomotives without proper protection.

# 20.0 WORKING AROUND TRACKS OR BEING ON EQUIPMENT

# 20.0 WORKING AROUND TRACKS OR BEING ON EQUIPMENT

## 20.1 Precautions Around Tracks and Moving Equipment

### 20.1.1 Walking On or Near Tracks

Do not stand or sit on, walk fouling of or walk between rails of a track unless required by assigned duties.

When standing, walking, or working between or near tracks, keep a careful lookout in both directions for trains, locomotives, cars or other moving equipment and expect movement at any time, on any track, in either direction. Do not rely on hearing the approach of a train or equipment.

Foremen or others in charge of employees working on or about the tracks must require the employees to be alert and watchful and to keep out of danger.

### 20.1.2 Precautions near Passing Trains or Equipment

When near passing trains or equipment:

- Move away from the track to avoid being struck by car doors, protruding or falling articles.
- Stand clear of all tracks when trains are approaching or passing in either direction. Do not stand on one track while trains are passing on an adjacent track.
- Do not allow yourself or others to be next to or between equipment while a train or equipment is closely passing on the adjacent track.
- Do not rely on others to notify you of an approaching train, engine or other equipment unless that person's duties include providing warnings.

### 20.1.3 Signals for Movement

After giving a signal to stop the movement, keep clear until the equipment has stopped. Do not give a signal to move equipment if anyone is foul of your movement.

## 20.2 Crossing Tracks

### 20.2.1 Step over Rail

When walking near or crossing tracks, step over, not on:

- rails,
- frogs,
- switches,
- guardrails, etc.

Walk straight across tracks at a right angle when possible. Watch for conditions that could interfere with footing.

### 20.2.2 Sufficient Distance

Unless otherwise authorized, when crossing/stepping foul of tracks, employees must not:

- cross or step foul of tracks closely in front of or behind moving equipment,
- go between standing equipment if the opening is less than 50 feet,
- cross tracks unless there is at least 25 feet between the employee and the equipment.

Unless otherwise authorized, employees must separate equipment at least 50 feet when it is necessary to separate equipment to make adjustments, including opening a knuckle by hand.

Mechanical Employees may go between or around the equipment in less than the specified distance provided the equipment is protected by GCOR Rule 5.13 (Blue Flag Protection), and the employee knows that no movement will be made. (MECH)

### 20.2.3 Sufficient Distance (Classification Yards)

In Classification Yards, additional safeguards are necessary when required to work between or on the end of equipment.

In bowl tracks, or other locations where cars are likely to roll together, separate cars by at least 100 feet before open a knuckle.

In bowl tracks, or other locations where cars are likely to roll together, separate cars by at least 100 feet, and apply sufficient hand brakes to prevent movement, but not less than 1 on the unattached portion, to prevent equipment from rolling, before performing any work between cars.

## 20.3 Safety Appliances

Visually inspect safety appliances on equipment for defects such as loose, damaged or missing hand holds, ladders, grab irons, sill steps or crossover platforms.

Do not use defective safety appliances. Warn others and report the defect to the train dispatcher or supervisor.

Do not attempt to mount equipment not equipped with safety devices.

## 20.4 Getting On or Off Equipment

Do not get on or off moving cars and engines except in emergency, and only when it can be done safely.

Mechanical Department employees cannot get off moving equipment for any reason.

### 20.4.1 Standing Equipment

The following precautions must be taken when getting on or off standing equipment:

- Always use the provided appliances (steps, ladders and hand holds) for getting on and off equipment. Be aware of and take necessary precautions to prevent injury from the buildup of snow, ice, water, mud, grease and oil on footwear, sill steps and side ladders.
- Keep hands free of all objects that may hinder a secure handhold. Always maintain a secure grip on the handholds on engine platforms or while using appliances on the equipment. Be prepared for sudden movement.
- Face the equipment, and use the side ladder or steps, maintaining a three-point contact (two feet and one hand or two hands and one foot). Feet must be securely placed.
- When getting off, retain a grip on the hand hold until one foot is firmly placed on the ground or other support.
- Observe surface conditions and activity in the area before getting off. Guard against injury by looking out for unsafe footing, obstructions or equipment moving on other tracks.
- When practical, get on or off equipment on the side away from main tracks or close clearances.
- Use extreme care during wet, muddy, snowy or icy conditions and at night in unlit areas.
- When practical detrain on the side opposite of a switch stand.

### 20.4.2 Moving Equipment

Employees are prohibited from getting on or off moving equipment, except in emergency, and when necessary to prevent injury to themselves or others. (TRANS)

If necessary to get on or off, the following precautions must also be taken:

- When getting on moving equipment, stand clear of equipment so as not to be struck. When boarding boxcars or similar equipment, grasp the leading grab iron with leading hand in direction of movement, then step up with the trailing foot as you grasp trailing grab iron, putting trailing foot in trailing corner of step letting movement lift you off the ground. Do not get on equipment moving more than 4 MPH.
- When getting off moving equipment, do not step between the rails, on tie ends or immediately ahead of switches. When getting off, make sure you are clear of the engine or car. The trailing foot (foot opposite from the direction of movement) must strike the ground first, directing you away from the equipment. Do not get off equipment moving more than 4 MPH.
- Mechanical Department employees are not permitted to get on or off a moving locomotive.

### 20.4.3 Loading and Unloading Luggage and Material

Do not throw or "swing" luggage or material onto a locomotive from the ground. Load luggage, grips without straps, ice chests, and other objects onto locomotives and cabooses before you get on. Unload luggage, grips without straps, ice chests, and other objects from locomotives and cabooses after you are positioned on the ground. Load or unload from the side of the locomotive, not the front.

Maintain firm footing and use proper body mechanics / lifting techniques and, if necessary, pass the item to your co-worker. Board or detrain carrying grips with shoulder straps on your shoulder and maintain both three-point contact and your balance.

## 20.5 Crossing Through or Fouling Equipment

Do not get on, cross through, crawl, sit or lie under cars, unless duties require. When duties require, assure that all movement has stopped, protection has been provided and no unexpected movement will occur.

Unless otherwise authorized, before an employee steps foul of a track to work on or make adjustments to equipment in a train, the employee must notify, if applicable:

- all crew members

When applicable, Rule 20.5.4, Understanding Between Crew Members Before Fouling Equipment (3-Point Protection), will apply.

### 20.5.1 Crossing Through Standing Equipment

When duties require crossing through a cut of cars that is not part of a train, the following applies:

- Choose equipment carefully, using only cars with ends equipped with a crossover platform and hand holds, when available.
- Keep hands free of objects that may hinder a secure handhold.
- Be prepared for unexpected movement, maintaining a three-point contact (two feet and one hand or both hands and one foot) while walking across the end of the car.
- On equipment where crossover platforms and hand holds are not available, use end of car structural bracing to maintain three-point contact, if safe to do so. If no structural bracing is available, do not cross through. However, a train or cut of cars made up of intermodal cars equipped with crossover platforms without handholds may be crossed through without three-point contact; taking short, deliberate steps.

### 20.5.2 Stepping from One Car to Another

Stepping from one car to another is not permitted.

### 20.5.3 Moving Cars

Do not cross under, over or through or ride between moving cars.

Some maintenance activities require movement from car to car. Equipment must be designed for such movement. (ENGR)

Such activities include:

- rail loading and unloading,
- rail grinding,
- car top material handling,
- loading and unloading wheeled equipment from flatcars.

### 20.5.4 Understanding Between Crew Members Before Fouling Equipment (THREE-POINT PROTECTION)

Before an employee steps foul of a track to work on or make adjustments to equipment or cross through cars, when the equipment is coupled to an occupied engine, active remote control engine or other motive equipment, or if engine is on the same track, the following applies:

- The employee must notify all crew members. However, notification is not required when the primary RCO opens knuckles during switching operations.

- Notification may be verbal between the employees, agreed upon hand signal, or radio communication.

- The engineer must apply locomotive air brakes, center the reverser and when necessary apply the train air brakes.

- The engineer will then notify the employee the engine has “3-Point Protection” applied.

- When employee is clear of the track, the employee will notify all crew members they are clear of the track.

- Engine settings or transmitter settings must not be changed until acknowledgement is complete between employee controlling the engine and employee reporting clear of the track.

**NOTE**: Direct verbal communication may only be used when an employee will be foul of the track numerous times performing a single task, such as coupling air hoses, releasing or setting a number of hand brakes, etc.

The communication may take place before the employee starts the task and will not require any additional communications while the employee continues to foul the track completing the task.

## 20.6 Placing Feet

Do not place feet on knuckles, uncoupling lever, drawbar assembly or any cushioning drawbar device.

## 20.7 Riding on Moving Equipment

1. Determine if You Should Ride

Ride cars or equipment only if necessary and only after determining that you can do so safely. When determining whether cars or equipment should be ridden employees must consider:

- Alternatives such as repositioning locomotives to pull instead of shoving cars, use of vehicle transportation, repositioning of crew members or utilizing other employees to complete the task without having to ride moving equipment.
- Weather conditions that may cause unsafe conditions to ride, e.g. ice storms.
- Designs and configuration of cars that may make them unsuitable to ride.
- Selecting or repositioning other cars to ride.
- Your physical limitations.
- Potential slack action. (The amount of slack in the train or cut of cars.)
- Applicable Operating and Safety Rules.

When equipment will be ridden:

- Notify the engineer.
- Proceed only after the engineer has acknowledged that you are going to ride.

If track condition cannot clearly be observed because of debris (e.g. snow, ice, water, grain, mud, etc.) do not ride or knowingly allow others to ride on either side of equipment or engine exterior.

When snow and ice are observed building up on portion of tracks to be used, particularly at road crossings, locomotive(s) must precede movement on that portion of track before cars can be ridden into those tracks.

2. Do Not Ride

   Employees must not ride:
   - On the end of a moving car - except as provided in this rule.
   - On equipment where track conditions cannot be clearly observed because of debris, snow, ice, water, grain, sand or mud.
   - On sill step of cars (stirrup beneath ladder), engine steps, caboose steps or vestibule steps of cars when moving over a street or highway crossing, or yard access crossing.
   - Yard access crossing means a grade crossing that is located within the physical confines of a railroad yard and is either:
     - Open to unrestricted public access; or
     - Open to persons other than railroad employees going about their normal duties, e.g., business guests or family members.
   - On side ladders leading to engine cabs on full body type locomotives.
   - On the side ladder providing access to top of tank car.
   - Inside equipment i.e. hopper cars, gondola cars, etc.
   - On any part of coupler apparatus, center sill, side sill, or end sill.
   - In a location where you may be struck or pinched by moving lading or equipment.

3. How to Ride

   When riding on equipment employees must:
   - Maintain three-point contact with hands and feet on fixed platforms and/or grab irons designed for this purpose. Hand brake may not be used as one of the required points of contact.
   - Look in the direction of movement.
   - Ride on the side of the car, the vertical plane of the end of the car must not be broken; except:
     - May ride on the brake platform or end platform on the trailing end of the last car.
     - When allowed to ride on the deck of a flat car.
   - Only ride on cars equipped with two vertical hand holds or horizontal hand hold positioned to allow an erect body position.

4. Where to Ride

   When riding on equipment employees must be positioned:
   - When possible, while making a pulling movement on the brake platform or end platform on the trailing end of the last car.
   - On side ladder of leading end of equipment in direction of movement.

### 20.7.1 Unexpected Movement

When on or in engines, cars, cabooses or other equipment, anticipate and protect yourself from sudden stops, starts, slack action, excessive lateral, or unexpected motions.

When duties require moving around in equipment, be adequately braced, maintain a firm hand hold and sit down quickly and safely. Unless duties require otherwise, remain seated when stopping, entering or leaving initial or final terminals. Stay out of cars being or about to be switched and notify all occupants before switching cars.

### 20.7.2 Shifting Lading

Do not:

- Stand or place any part of your body on or between the side or end of a car loaded with lumber, pipe or other lading that could shift.
- Put yourself in a position where you can be struck by improperly secured or unsecured drop ends that may fall inwards.
- Hold on to the end post or stand near the end door on a gondola equipped with drop ends.

### 20.7.3 Riding Tank Cars

- Avoid riding on tank cars when it can be avoided.
- If necessary, employee must position themselves on the outer edge of the crossover platform and maintain a three-point contact or four-point contact (two feet and both hands).
- Do not ride on the side ladder of a tank car.

### 20.7.4 Riding Bulkhead or Center Beam Flat Cars

- Avoid riding the side of bulkhead flat cars and center beam flat cars unless equipped with horizontal grab irons that are at least chest height when standing on sill step.
- When riding a bulkhead flat car or center beam flat cars, do not place any part of your body between lading and bulkhead.
- It is permissible to ride on the deck of an empty bulkhead flat car or empty center beam flat car.
- When doing so, employee must position themselves on the deck behind the bulkhead in the direction of movement.
- Maintain a three-point contact (two feet and one hand) with a firm grip on the side grab iron and face the direction of movement.
- Employees must not reposition for dismount until movement has stopped.

## 20.7.5 Riding Intermodal Equipment

Avoid riding flat cars unless equipped with either two vertically mounted hand holds, or horizontal grab irons that are part of a riding ladder and of sufficient height to provide balance. If necessary to ride flat cars not so equipped:

- Take a safe position near the center of the car, either seated or with feet shoulder width apart, with one foot forward and knees slightly bent.
- Face and look in the direction of movement.
- Use extreme caution and be prepared for slack action or unexpected movement
- Remain seated until movement stops.

In addition:

- Riding the side of any flat car or any type of intermodal equipment not equipped with either hand holds or grab irons described above is prohibited.
- Observe for close clearances and, if necessary, stop the movement and protect in advance of further movement from the ground.

## 20.7.6 Business Cars or Passenger Equipment

Side and trap doors of vestibules must be kept closed while the train is in motion, except when attended by a crew member. An end gate or chain must be placed at the rear of the last car in a train.

Trainmen must know that end gates or chains are in the proper position at the end of each car when making cuts between occupied passenger cars during switching operations.

### 20.7.7 Riding Locomotive Cranes and Work Equipment (ENG)

Do not go out on a ledge, running board or any other outside part of moving locomotive cranes or other roadway equipment. However, a designated ground man is permitted to ride on the locomotive crane footboard that is equipped with a standard riding cage under the following conditions:

- Riding is only allowed at the project site and as necessary to support bridge work. The limitations of the project site shall be as follows:
- From the material staging area to the bridge, not to exceed 1,400 feet and No more than 300 feet past either end of the bridge.
- Riding is not permitted through public road crossings.
- The maximum crane speed is 10 MPH.
- When riding on the leading end, the crane operator must have the rider in visual sight at all times.
- Riding is not permitted on the same end of the crane that cars are coupled to.
- The crane will approach no closer than one car length from standing equipment.

The footboard shall be large enough to completely and firmly support both feet of the rider. The rider must have three-point contact at all times.

- The footboard and riding cage must be inspected daily and repaired immediately if damaged.
- Cage must be removed when the locomotive crane is entrained.

Do not ride on cranes, ditchers, or other machines or cars on which machines are mounted without proper authority.

## 20.8 Close Clearances (ENGR/MECH)

### 20.8.1 Avoid Fouling Hazards

Do not leave equipment standing where it will foul equipment on adjacent tracks or cause injury to employees riding on the side of a car or engine.

On tracks where clearance point is indicated, leave equipment beyond the clearance point.

If clearance point is not indicated or visible, determine clearance point by standing outside the rail of adjacent track and extending arm towards the equipment. When unable to touch equipment, leave the equipment at least an additional 50 feet into the track to ensure equipment is beyond the clearance point.

Equipment may be left on a:

- Main track, fouling a siding track switch, when the switch is lined for the main track.
- Siding, fouling a main track switch, when the switch is lined for the siding.
- Yard switching lead, fouling a yard track switch, when the switch is lined for the yard switching lead.
- Industry track beyond the clearance point of the switch leading to the industry.

When machines, tools, material or other equipment are left where adjacent track(s) may be fouled, notify proper authority. They must arrange to restrict movement on the affected track(s) until the work is completed, and the fouling hazard is eliminated.

Do not leave an unprotected condition.

### 20.8.2 Maintain Lookout

Keep a careful lookout in both directions for trains, engines, cars or other moveable equipment on adjacent tracks. Look for other close clearances when duties require any part of the body to be extended beyond the side of a moving or standing engine or car.

### 20.8.3 Impaired Clearances

Do not ride on the side of a moving car, engine or other equipment under any of the following conditions:

- Next to a structure.
- Through gates or doorways.
- Into, out of, or within enclosed buildings. Before entering enclosed buildings, an employee, if safe to do so, must precede the movement. Further movements must only be made on that employee's signal.
- Any time equipment on an adjacent track is foul of or appears to be foul of clearance point.
- Locations designated in the timetable or by signage.

Do not position yourself or knowingly allow others to position themselves between a structure and moving car(s), engine(s) or other equipment when clearance is minimal.

## 20.9 Moving Equipment in Locomotive, Car, or M/W Repair Facilities

Before moving any equipment, a job briefing will be conducted between all involved in the move which must include a thorough understanding of what will happen and what hand signals or radio communications will be used.

- Cars must be coupled or secured to the locomotive, car mover or equipment, unless Repair Facility car moving systems are designed for other operation.
- Maximum speed must not exceed 5 mph.
- If hand signals are used, and the person giving signals disappears from view, movement must be stopped (see GCOR Rule 5.3.3, Signal Disappearance).
- If radio communication is used, distance and direction must be specified (see GCOR Rule 5.3.7 Radio Response).

### 20.9.1 Using Mobile Equipment (MECH)

When using a Trackmobile, car mover or other work equipment as the prime mover:

- Cars will be inspected for safety defects prior to movement. If defects are found that prevent safe movement, corrective action must be taken to prevent derailment or further damage. Required inspection reports must be completed at the start of every shift.
- The operator or ground man will notify all affected employees, including others moving cars and/or locomotives, prior to movement. Car(s) will be inspected for persons on, under or between before coupling.
- When coupling to cars, the operator or ground man must observe that coupler pin has dropped before movement. Cars left standing must be properly secured. When necessary to work between the Trackmobile and other equipment, a separation of not less than 50 feet must be made, and the machine stopped before commencing work.
- Pedestrian and vehicular crossings will be cleared prior to movement. A ground man will ensure that vehicles or pedestrians do not foul the move.
- When entering or exiting the Car Repair Facility, the horn will be sounded.
- A ground man must be in a position to protect the movement when the operator is not pulling the cars. The ground man must remain in plain sight on the operator's side. If visual contact is lost between operator and ground man, all movement must stop.
- Three Point Contact is required when mounting and dismounting the Trackmobile. Face the equipment when dismounting.
- It is not permissible to get on or off a moving Trackmobile.
- When leaving the Trackmobile, the parking brake must be set.

## 20.9.2 Using Locomotive (MECH)

When locomotive is used as the controlling unit, either single, as multiple coupled units, or a locomotive consist:

- If the operator is in the lead unit with the controlling cab facing the direction of movement, protection for the movement is not required if the operator can visually determine that there are no obstructions and the move can be made safely.
- Do not exceed 5MPH in all Mechanical Department facilities.
- The bell must be rung at all time while moving within Mechanical Department facility limits.
- All hand brakes must be released in a locomotive consist before moving.
- Visual inspection must be made to assure that there are no obstructions, portable ramps, or blue flags in place prior to movement.
- If the operator is not in the lead unit with the controlling cab facing the direction of movement, protection for the movement is required and an attendant must be positioned on the end of the locomotive in the direction of movement or a ground man positioned ahead of the move to be able to visually determine there are no obstructions in the direction of movement and the movement can be made safely.
- Mechanical Department personnel are not permitted to ride over yard access crossings on the lower step of a locomotive. Mechanical employees must be positioned not lower than the third step to protect against collision with standing or moving objects.
- When a spotting operation involves movement of less than ten feet, the movement may be made without a ground man ahead of the movement.
- When making coupling, attendant must stop movement and be on the ground when coupling is made.
- After coupling to other equipment, stretch the slack to ensure the coupling was made.
- After movement is complete, secure all locomotives and/or equipment as per Air Brake and Train Handling rules. Follow applicable shut-down policy.

## 20.9.3 Moving Locomotives in Diesel Shop (MECH)

Before moving locomotives in the Diesel Shop it must be known that:

- All personnel working on the track affected are aware of the movement.
- Doors are fully raised and the track is clear.

After moving locomotives in the Diesel Shop ensure the following:

- Shut the locomotive down, unless otherwise instructed.
- Apply locomotive brakes, and set hand brakes on locomotive consist.
- Ensure throttle is off and Generator Field Switch is in down position.

When moving locomotives in the Diesel Shop, ensure the following:

- All personnel are clear of the locomotive consist.
- Independent Brake must be set and operable.
- Hand Brakes are released in the locomotive consist.
- Reverser is properly positioned for intended direction of movement.
- Throttle usage is in the first two notches.
- Locomotive brake is slowly released when starting movement.

### 20.9.4 Securing Locomotives in Diesel Shop (MECH)

When leaving locomotives unattended, after movement, do the following:

- Leave throttle in IDLE position
- Ensure reverser is in NEUTRAL and removed.
- Generator Field Switch placed to OFF position.
- Automatic brake value is in the RELEASE position.
- Isolation switch is placed in the START/STOP/ISOLATE position.

## 20.10 Hand Brakes

When operating hand brake inspect for defects. Use good body mechanics. Have firm footing and hand hold to prevent slipping, falling or injuries (e.g., sprains, strains).

When applying or releasing wheel type brake, thumb must be positioned on the outside of the wheel. End-mounted brake on equipment equipped with a brake step or platform and locomotive hand brake must be applied or released from a position on the equipment.

When climbing on equipment, maintain at least a three-point contact.

Three-point contact consists of both feet and one hand or both hands and one foot touching the equipment.

When in position to apply or release an end-mounted brake with a platform, place your left foot on the ladder rung and your right foot on the brake platform.

Grasp a ladder rung or the top hand hold with your left hand and operate the brake with your right hand.

Do not place both hands on the brake wheel.

Side-mounted hand brake on equipment may be operated from the ground provided the brake mechanism is within easy reach and you are able to use good body mechanics while operating them.

End-mounted hand brake on TOFC/COFC and similarly configured cars without brake steps or crossover platforms must be operated from a position on the car or from the ground at the side of the car.

Horizontal wheel (staff) hand brake on any car, and end-mounted inward facing hand brake on TOFC/COFC cars, must be operated from a position on the car.

Hand brake must not be applied or released from the ground when car is in motion.

The use of a brake club, bar or other material to apply or release the brake is prohibited.

In addition, do not:

1. use end ladders to go up or down the car,
2. brace any part of your body against another car,
3. place feet in a wheel or on a hand brake lever or pawl,
4. hold brake tension on a moving car by hand without using a pawl and ratchet,
5. place undue strain on your body which may cause physical injury.

### 20.10.1 Releasing Hand Brake

Use caution when releasing hand brake. Obtain help when necessary. Avoid being struck by the brake wheel when the pawl is released. Avoid having clothing or hand caught in a spinning brake wheel.

When unable to release a hand brake that has been set after an air brake application, if possible, follow this procedure:

- Recharge train line pressure of the car.
- Reapply air brake (to relieve tension on the hand brake chain).
- Release the hand brake by hand.

### 20.10.2 Difficult or Defective Hand Brake

If hand brake is difficult to operate, or if it is defective or damaged such that it does not function properly, do not attempt to operate it.

Report the defective brake to proper authority and attach a bad order tag to hand brake wheel or lever. When leaving a car in this circumstance, leave an additional car with a working hand brake to secure the cut.

### 20.10.3 Brake Sticks

Brake Sticks supplied by the company may be used to apply and release handbrakes.

The brake stick may be used only for the purpose for which it was designed.

In addition:

- The Brake Stick must always be in the locked position except when adjusting length. The Brake Stick may be used to adjust knuckles, release/apply retainer valves, remove skates, and check the EOTD reset button.
- NEVER use the Brake Stick to operate quick release handles.
- Quick release hand brakes can be released by rotating the hand brake counter clockwise just like non-quick release handbrakes.
- Use good body mechanics.
- Keep a firm footing and handhold.
- Position yourself parallel to the wheel.
- The Brake Stick will travel to the side of your body not into your body.
- Use both hands with feet 12 inches apart.
- The Brake Stick must be in the collapsed and locked position when carrying and/or storing.
- The Brakes Stick must not be stored in an area where it may be an obstruction or may present a tripping hazard.
- Brake stick holders on locomotives will be used to store brake sticks, when available.

These areas include building and equipment walkways, steps, seats, or in the passenger compartment of a vehicle.

## 20.11 Wheel Chocks

Use wheel chocks where required. When installing or removing wheel chocks, keep all parts of your body outside of the rail and avoid pinch points.

## 20.12 Coupling and Uncoupling

When riding equipment other than a locomotive, to a coupling, movement must be stopped short of the coupling. Employee will then get off equipment to make the coupling from the ground.

When couplings are being made:

- Stand in the clear when a coupling or uncoupling is being made.
- To avoid by-passed couplers, make sure couplers are in proper alignment and at least one knuckle is open.
- Stop the movement before coupling when necessary to ensure couplers are in proper alignment and knuckle is open.
- Stop the movement at least 50 feet, but not more than 250 feet before coupling to equipment. Comply with GCOR 7.4.1 Safety Stop.
- When coupling, Employees must ensure that:
    - Coupler is aligned
    - At least one of the knuckles is open
    - Light engines must stop 50 feet before coupling to equipment
    - Remote control light engines must stop 50 feet before coupling to equipment and then couple at "Couple Speed"
    - Employees must not ride cars to coupling
- Do not:
    - Use your feet to operate the uncoupling lever.
    - Use excessive force or jerk on the uncoupling lever which may cause physical injury.
    - Operate an uncoupling lever on a car or engine while riding on another car or engine.
    - Do not use foot or hand to adjust drawbar or knuckle while cars or engines involved are in motion or about to couple.

Be alert for pinch points. Always place your hand on portion of uncoupling lever that is designed as the handle.

Use the uncoupling lever to open knuckles when possible. If lever is inoperative, protect against injury by not using excessive force. If cars are moving, stop movement, and have an understanding with other crew members before crossing over cars to operate uncoupling lever on the other car.

If you must use hands to open the knuckle on standing equipment, keep both feet from between the rails if possible. During coupling operations, separate equipment at least 50 feet, and stop equipment before reaching in on all tracks except bowl tracks, or tracks where cars are likely to roll together, see Rule 20.12.1.

Make sure the knuckle pin is in place before putting your hand on the knuckle.

Never use a foot to adjust a drawbar or knuckle, know that the knuckle pin is in place before making adjustments.

When air hose is charged, turn your face away from the air hose while uncoupling (see Rule 20.12.6, Coupling and Uncoupling Hoses).

### 20.12.1 Going between Cars

Going between moving equipment for any reason is prohibited

Signal must not be given to move locomotives or cars while an employee is between or at the end of equipment.

When it is necessary to separate equipment to make adjustments, the following applies:

- Separate the equipment at least 50 feet.
- Allow the slack to adjust.
- Follow Three Step Protection procedures. (See 20.5.4 Three-Step Protection)

NOTE:
On Classification Yard Bowl Tracks, and on tracks where cars are likely to roll together, separate cars by at least 100 feet, then apply sufficient hand brakes, but not less than one, on the unattached portion to prevent movement before going between cars.

## 20.12.2 Coupler and End Sill

Do not place any part of the body on or between a coupler and car end sill.

When near cars equipped with movable center sills, take precautions to avoid injury in case of movement, even though the car is standing.

## 20.12.3 Coupler Adjustment

When necessary to make a coupler adjustment:

- Separate equipment at least 50 feet and equipment must be stopped,
- When manually adjusting couplers, carefully follow the procedures outlined in Rule 10.3, Lifting and Moving Material,
- Do not kick or use your foot to make a coupler adjustment,
- Coupler must move without applying excessive force.

## 20.12.4 Replacing Knuckles

Use the correct knuckle type:

1. Make sure the knuckle is closed.
2. Remove the knuckle pin and place within easy reach.
3. Keep your feet clear of the area under the coupler, and then open the knuckle, allowing it to fall to the ground while turning your head away.
4. Holding the uncoupling lever up, move the knuckle thrower back into the coupler recess as far as it will go.
5. Using proper lifting techniques, including holding it as close to the body as possible, dispose of the knuckle where it will not become a tripping hazard.
6. Use good body mechanics to lift and carry the replacement knuckle and place it into the coupler pocket.
7. Insert the knuckle pin into the pin hole. Close the knuckle and check to see that it locks properly. Do not close it with your foot.
8. If necessary, seek assistance from others if unable to replace safely.

## 20.12.5 Opening Angle Cock

Do not kick, strike or shake pressurized hose couplings. Turning angle cock on moving equipment is prohibited. Turning angle cock by reaching across drawbar/coupler is prohibited.

Any time it is necessary open an angle cock on any car or locomotive, the employee must presume that it contains air pressure. Always hold the end of the hose firmly to prevent hose coupling from uncontrolled movement, causing injury.

Before opening the angle cock to an uncoupled air hose:

1. Grasp the hose at the glad hand, clear of the vent port.
2. Brace the glad hand firmly against your thigh, use the outside of your left leg, just above the knee, with vent port directed away from the employee.
3. Turn your face away from the glad hand before opening the angle cock.
4. Open angle cock slowly,

When opening an angle cock with coupled air hoses, the following procedure must be used:

1. Open angle cock slowly. Do not use excessive force.
2. Keep legs and feet clear of the air hose coupling.
3. Listen for air escaping, which will indicate a faulty coupling.
4. If an air leak is heard, close both angle cocks and make sure the pressure in the hoses is fully depleted before attempting any adjustment or repair.

## 20.12.6 Coupling and Uncoupling Air Hoses

- Avoid being struck when coupling or uncoupling air hoses.
- Before coupling or uncoupling air hoses by hand, or before operating angle cocks, have a clear understanding with the engineer and other crew members as to the work to be performed.
- When coupling or uncoupling air hoses by hand, keep one foot outside the rail and place the other inside the rail. However, when coupling high air dump hoses on cars so equipped, it is permissible to place both feet between the rails. Be prepared to step out should the equipment move. The preferred method for uncoupling air hoses is to allow them to pull part with the movement of the cars.
- When necessary to uncouple air brake hoses by hand, close both angle cocks, grasp the hoses firmly and slowly break connection to reduce pressure in hoses. Turn your face away while uncoupling the hoses to avoid flying debris and particles.
- When separating locomotives, allow air hoses to pull apart with the movement of the locomotives.
- Kicking at or striking an air hose to stop a leak is prohibited.

## 20.13 Dump Cars (ENG)

When dumping loads or working around dump doors:

- Before opening the dump door on a car, ensure that all persons are clear on both sides and that no one is inside the car.
- Do not close dump doors of empty cars while cars are in motion.
- Do not be on or inside cars when it is necessary to "shake" or "bump" cars to loosen gravel or other material.
- Do not ride in air dump cars.

Be sure dump doors on cars are closed after a load is dumped. If car must be moved short distances with the dump doors open, make sure the doors and chains will clear tracks and crossings.

## 20.14 Car Doors (ENGR/MECH)

When opening or closing doors, keep fingers clear of the edge or door jamb, casting or rail on which the door travels. Keep your body clear of the door opening to avoid injury from falling freight.

Check box car doors for damage by thoroughly inspecting the top and bottom track and rollers. On plug doors examine the roller assembly, locking rods and all crank arms. Make sure the door is properly tracked before opening it. If the door is off track, take necessary precautions before opening it. If there is evidence of load shift, i.e. bulging door, take action to relieve the pressure on the car door before opening it. Guard against spinning or kicking of handles.

Do not move car, without door stops in place, unless the door has been secured by other means to prevent movement of the door.

Close and open doors with a mechanical device if normal force used by one person cannot accomplish the task. Use of excessive force is prohibited. Always position yourself in the clear, should the door fall, and be prepared for any sudden movement of the door. Use proper body positioning to prevent injury.

Train service employees should not attempt to close plug or swinging type doors. If a plug door is found open enroute, car must be set out at the next available location.

## 20.15 Load Dividers (MECH)

Inspect the load dividers on a railcar carefully before operating to be certain load divider is properly tracked. The upper and lower crane rails must be free of defect that could derail or hinder load divider operations. If load divider is off track or safety straps are not in place, necessary precautions must be taken to safeguard its use. Do not push or move the door into an area that has not been inspected or is not properly tracked.

Operators should position their body to prevent injury in the event of unsuspected movement, falling or stopping of load divider. While operating load dividers, fingers must be kept clear of pinch points and feet clear of gate swing to avoid foot injury.

## 20.16 Cars Being Loaded or Unloaded (MECH/ENGR)

Personnel who load or unload cars are responsible to:

- Remove and clear platforms, boards, tank car couplings and connections, conveyers, loading or unloading spouts, similar appliances or connections, vehicles and other obstructions.
- Ensure plug-type and swinging doors on cars are closed.
- Make sure persons in, on or about cars have vacated cars before allowing switching.
- Avoid damaging lading of partly loaded cars.
- If cars are equipped with bridge plates, raise and lock the plates.

Preventing Uneven Loads. When loading or unloading cars, take precautions to prevent the load from becoming unevenly distributed which may cause the car to overturn or derail.

Do not handle cars with improper or uneven loads if the load could shift or fall from the car or the car could derail or overturn.

## 20.17 Loading Roadway Equipment (ENGR)

Observe loading rules when loading and securing roadway equipment, cranes, dragline or other similar equipment loaded on cars.

Cars loaded with roadway machinery must be inspected and must not be moved until they are approved for movement by the Mechanical or Engineering Department.

## 20.18 Air Brake Rigging (MECH)

When working on the air brake rigging of locomotives, cars or other equipment, the air brakes must be cut out and the air reservoir must be drained until repairs are completed.

## 20.19 Moving In and Out of Equipment, or On Equipment

Always use door handles or grab irons to open and close doors. Wind and slack action will often cause the doors to slam shut. Face the door and keep hands and fingers clear of door edges and door jams. Always use grab irons, railing or other secure fixtures to prevent being thrown about.

When entering equipment, be observant. Allow eyes to adjust to changing light level.

At night turn on interior lights, if available, and use a light in areas of low visibility (see Rule 19.6, Working at Night Or Low Light Level).

When entering equipment, be prepared for missing floor panels.

Equipment varies in step and ladder arrangement.

Do not allow tools, chains or other items to be placed where you have to step.

When entering equipment be prepared for electrical or other compartment doors that may have been left open. Keep all electrical and other compartment doors securely

latched when locomotive is under load, except when locomotive forces are conducting load tests. Report all defective latches and doors that will not stay closed.

If you observe oil or other foreign substances on ladders, steps or walkways, warn other employees and if practicable, avoid using that part of the equipment until the condition is corrected. Be sure you report it properly if you cannot correct it yourself.

## 20.20 Locomotives, Working On or About (MECH)

The generator field switch must be in the "OFF" position while working on or inspecting the main generator or power circuits on diesel locomotives. On multiple unit locomotives, the power plant must be isolated from control. When traction motors are to be inspected, the generator field switch must be "OFF", the throttle closed, the reverser handle removed and the air brakes set. At locations other than established inspection or shop locations, the employee making the inspection must carry the reverser handle with him while making the inspection and tag the control stand "out of service".

Do not repair any switches, contactors or relays on locomotives without first shutting down the diesel engine and opening the control switch and the main battery switch. Do not attempt repairs on switches, contractor relays or related electrical apparatus without first shutting off all power. A volt meter must be used to ensure all current has been disconnected before starting repairs.

### 20.20.1 General Requirements (MECH)

While working on or about locomotives:

- know that all workmen are in a safe position before starting an engine,
- when applicable, keep safety guards in position and fastened,
- keep hands out of radiator shutters and all other equipment that engage automatically.
- keep engine room, cab, running boards, catwalks, steps and grab irons clean and free from oil, grease, rags, debris, obstructions, snow, ice, sand, etc,
- place material or equipment on locomotives where it will not create a hazard while being transported.

### 20.20.2 Restrictions (MECH)

Do not:

- put face or hands near the main generator or any high-voltage equipment while it is working under load,
- smoke or have an open flame in the engine room,
- pull fuses while they are under load,
- open ground relay protective knife switches when ground relay is tripping,
- manually operate high-voltage contactors while the engine is in motion, even though the power plant supplying that particular cabinet is shut down,
- use hands, feet or improvised objects to close or open contacts while under electrical load,

- open high-voltage cabinet when the engine is under load.

EXCEPTION: This does not apply to mechanical forces for inspection purposes.

After performing engine maintenance, make sure no tools are left lying near electrical or rotating equipment.

### 20.20.3 Locomotive Cab Floor (MECH)

If necessary to remove floor boards for inspection or repair purposes:

- "Danger" sign must be placed at each door to the locomotive cab at all times when the floor board(s) are removed.
- Floor board(s) should be replaced when leaving the cab. If it is not practical to replace the floor boards due to work in progress and there is potential for anyone entering the cab, the cab doors must have yellow caution tape tied across the door openings. If available, a flashing red strobe light may also be left in the locomotive cab.
- If possible, locomotive cab lights should be left on so the opening is visible.
- Floor board(s) must be replaced when work is complete.

## 20.21 Securing Supply Apparatus (MECH)

When supplying a train with fuel, water and/or sand, replace and secure the apparatus in a position clear of tracks.

# 21.0 HANDLING SWITCHES AND DERAILS

## 21.1 Switches and Derails - Authority

Unauthorized persons must not unlock or handle switches or derails.

## 21.2 Operating Switch by Hand

When switch is to be operated by hand, equipment must not pass the following limits:

Trailing Point movement:

- Stop movement at clearance point.

Facing Point movement:

- Stop movement not less than 20 feet from switch points to prevent binding of switch points.

Facing point movement is moving into the switch points or making movement from the switch points into the body of the switch. Trailing point movement is moving through the switch in the opposite direction.

## 21.3 Switch Operation

Switches have different physical operating characteristics. Be familiar with the procedures for properly lining each type of switch. Always remember that the ease with which a switch operates will change depending on weather, temperature and other operating conditions.

Using foot on switch levers for the purpose of operating the switch is prohibited.
Before operating a switch or derail:

1. Look in both directions and be alert for moving equipment on adjacent tracks.
2. Before lining the switch, visually inspect it, and make sure it is not damaged, locked, tagged or spiked and that points are not obstructed by ballast, ice, snow, or other material which may interfere with the normal movement of switch points.
3. If necessary to remove foreign material between the switch point and stock rail, use a broom, stick or similar object. Do not use your hand or foot for this purpose. If the switch is spiked, do not attempt to operate it.
4. Always take a firm stance and be alert for conditions which may cause loss of footing.
5. While handling a switch or derail, keep hands and feet clear to avoid being caught or struck by the derail or the switch lever handle or ball.

After operating a switch or derail:

1. Make sure the switch points fit properly.
2. When removing a derail, make sure it completes its entire arc and is resting on the ties.

## 21.4 Defective Switches

When any switch is found hard to operate, defective, or in need of maintenance, do the following:

- Take the switch out of service.
- Report the switch to the proper authority, including its exact location and problem.
- Tag the defective switch with a warning tag describing the defect.

The switch must remain out of service until an inspection and repairs can be completed.

## 21.5 Spiked Switches

Apply a yellow tag to any inoperable switch or switch requiring maintenance. Spike switch when necessary. Any switch that is spiked must be marked with a yellow tag attached to the lock or chained to switches not equipped with a lock. Only Engineering Department employees may spike or clamp switches.

## 21.6 Operating High/Low-Stand Switch

Do not use your feet to operate this type of switch or secure the handle.

CAUTION: The switch handle may be under compression and may swing around when released from the keeper slot.

When operating a high/low stand switch:

1. Lift up on the switch handle, keeping the body clear of handle movement.
2. Pull the handle slowly through its arc of travel. Expect that the switch may suddenly operate in either an easy or stiff manner. Always keep firmly braced and do not exert unnecessary force.
3. Do not jerk the handle and avoid placing the body in a twisted or awkward position. Reposition feet as necessary to maintain good body mechanics. Use leg muscles instead of back muscles.
4. When switch is in the desired position, fully insert the handle into the keeper slot.
5. Once the handle is down, secure it with a lock or hook, when available.

Use either the two-hand or the mast-support method to lift the lever handle out of the base.

<u>Two-Hand Method</u>

When using the two-hand method:

1. Make a visual inspection of the switch points for any obstructions that may inhibit movement.
2. Stand facing the switch stand and place both hands near the end of the handle.
3. Lift up the switch handle, keeping your back as straight as possible and your legs slightly bent.
4. Make an obvious visual inspection to assure points are lined for the intended movement, and fully against the stock rail.

Mast-Support Method

When using the mast-support method:

1. Make an obvious visual inspection of the switch points for any obstructions that may inhibit movement.
2. Place one hand on the mast and the other hand on the end of the handle.
3. Stand parallel to the handle and slowly pull the handle through the line of travel.
4. After completing the move, stand as close to the handle as possible, leaving room for the handle to clear the body, and push the handle down.
5. Make an obvious visual inspection to assure points are lined for the intended movement, and fully against the stock rail.

## 21.7 Operating Lever-Action Switches

When operating a lever-action switch:

1. Take a firm stance and be alert for conditions that might cause loss of footing.
2. Make an obvious physical inspection of the points for any objects in the switch points that may inhibit movement of the switch.
3. Stand parallel to handle movement, with your stance centered over the lever arm handle. If the switch is equipped with a foot latch, keep your foot on the latch until the lever clears the latch or keeper.
4. Hand or other object must not be used to release latch. The switch lever may be under compression and could fly up when released from the latch or keeper.
5. Stand as close as possible to the lever arm, placing both hands on the handle.
6. While keeping your upper body erect, lift up slowly and smoothly, using your leg muscles.
7. Once the lever has traveled at least to the straight up position, reposition your feet and hands so that lever movement may be completed with a pushing motion. Try keeping the end of the handle between your shoulder blades throughout the arc of the handle's movement.
8. On switches where movement is completed in close proximity to the ground, it is permissible to use one foot to complete the last six inches of movement, provided that good balance is maintained. Place one foot near the end of the lever and step down until the lever arm is latched. Not applicable to 45 degree ergonomic switches.

   CAUTION: Avoid using your feet to push the lever arm down during wet, ice, or snow conditions, or if oil, grease, mud or other such contaminants are present.

Note: Steps 1 through 6 also apply to switches where handle movement begins and ends at approximately 45 degrees from horizontal.

9 When a switch is in the desired position, fully insert the handle into the slot using both hands.

10 Make an obvious visual inspection to assure points are lined for the intended movement, and fully against the stock rail.

## 21.8 Switch Point Locks

Switch point locks are installed on certain main track switches at the base of the rail and locked with a switch lock. Switches equipped with this device are identified by a white stripe on the switch stand.

1. To disengage the device, remove the lock and depress the foot pedal with your foot. This must be done before attempting to throw the switch. Do not use your hands or other device to depress the foot pedal.
2. To re-engage the device, snap the switch point lock into locking position by returning the switch to the normal position. Inspect to assure the locking position before putting your hands near the switch point lock or replacing the padlock. If the switch point lock fails to snap into locking position, reopen the switch and repeat the process.
3. If defects exist:
   - Do not attempt to pull the pedal by hand or other means.
   - Contact the train dispatcher and report the switch point lock as defective. Attach an out-of-service or warning tag to the switch.

## 21.9 Spring Switch

Do not manually operate a spring switch when springs are compressed by the wheels, except in an emergency. In an emergency, keep clear of the handle when it is released.

## 21.10 Power Switch

Take precautions to avoid injury when working on power-operated, remote or automatic control, or interlocking switches, derails, or movable point frogs.

- Keep hands and feet clear of connections.
- Do not place hands or feet between switch point and stock rail without first isolating the switch against remote operation.

Specific instructions for Power Assisted Switches (PAS) are shown in timetable special instructions under Rule 8.21.

## 21.11 Switch Heaters

Avoid contact with switch heaters or switch rails when heaters are operating.

# Glossary

## Authorized
The supervisor of an authorized employee has assured that the person under their direction has been qualified and is competent to perform their required work in a safe manner. Authorization in any other manner requires approval from another qualified person.

## Body Mechanics
Movement and positioning of the human body. A person that uses good body mechanics properly positions their body or parts of their body in relationship to tasks being performed, stabilizes movement, maintains good footing and grip, and avoids placing undue stress or strain on muscles, ligaments, and joints.

## Fouling a Track
Placement of an individual or a piece of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or on-track equipment, or in any case is within 4 feet of the field side of the near running rail.

## Fumes
Minute solid particles arising from the heating of a solid.

## Gases
A state of matter which diffuses with other gases, uniformly distributes itself when in a container and changes state as a result of changes in pressure and/or temperature.

## Ground man
The person assigned to assist an operator in assuring a safe operation. This is the designated person to give signals.

## Licensed
Person has completed appropriate training and passed required examinations.

## Operator
The person at the controls of a tool, machine or piece of equipment.

## Periodic Inspection
Inspection conducted as required based on usage of equipment, severity of service conditions, experience gained as to need, but at least annually.

## Qualified
Person has been trained and instructed to perform the work in a competent and safe manner.

## Toxic
A substance that can potentially cause harm to the body.

## Vapors
The gaseous form of substances which are normally in a solid or liquid state.


THE BELT RAILWAY OF CHICAGO