



# Transportation Employee Rule Book

## Critical Rules

### Railroad Operating Rules

### Air Brake and Train Handling Rules

### Safety Rules

All employees whose duties are in any way affected by these rules must comply with them. **These rules become effective at 12:01 A.M., Tuesday June 1, 2021.** At that time, all previous rules and instructions that are inconsistent with these rules become void.



## CRITICAL RULES

2.21 Games, Reading, or Electronic Devices

6.5 Shoving Movements

6.28 Movement on Other Than Main Track

7.6 Securing Cars or Engines

7.6.1 Single Car Securement

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8.2 Position of Switches

8.20 Derail Location and Position

81.2.2 Sufficient Distance

8.12 Hand Operated Crossover Switches

7.12 Movement into Spur (or Stub) Tracks

# #1

## **2.21 Games, Reading, or Electronic Devices**

Employees on duty must not:

- Play games.
- Use personal electronic devices. or
- Read magazines, newspapers or other literature not related to their duties when:
  - Performing safety related activities. or
  - It would delay or interfere with required duties.

This does not prohibit employees from having such material enclosed in their personal luggage while performing safety related activities.

### **Electrical Devices**

The restrictions in this rule apply to use of personal and railroad-supplied electronic devices by railroad operating employees and does not affect the use of railroad radios under FRA regulations. A railroad operating employee must not use an electronic device that would interfere with the performance of safety related duties. Electronic devices must not be used to verbally obtain or release a mandatory directive when radio communication is available.

Crewmembers are jointly responsible for compliance with the appropriate use of electronic devices.

### **Railroad Supplied Electronic Devices**

When required to be powered on for purposes of timely, automated updating or transmission of information, railroad-supplied electronic devices must be powered on. These devices may be used for exchange of work-related information during train or switching operations with railroad supervisors.

Crew members authorized to use railroad-supplied electronic devices may use such devices when:

- A job briefing is held, and all crewmembers agree the device is safe to use.
- Not on a moving train.
- The crewmember using the device is not fouling the track. (within 4 feet of nearest rail)

### Prohibited Use

Personal electronic devices are prohibited from use while on duty in safety-related situations and must be **TURNED OFF AND STOWED with any earpiece removed from the ear**. Use by any crew member in the cab of a controlling locomotive is prohibited when:

- On a moving train (except as described below under Permitted Use).
- Any member of the crew is on the ground or on moving equipment.
- Any railroad employee or authorized individual is inspecting or assisting in preparation of the train, engine, or on-track equipment for movement

### Permitted Use

Use of a personal electronic device at any time must not result in delays or interfere with safety-related duties of any crewmember, other employees, or personnel. After conducting a safety briefing and agreeing the use of the device is safe, a personal electronic device may be used as follows:

- Responding to an emergency involving the operation of the railroad, an emergency encountered on duty, or when necessary due to a radio malfunction.
- A camera may be used to take a photograph of a safety hazard or a violation of a rail safety law, regulation, order, or standard provided it is a standalone camera. A camera that is part of a cell phone or other similar multi-functional electronic device is not included in this exception unless it is a railroad-supplied device and is used for an authorized business purpose. The camera must be turned off immediately after the photograph is taken and the camera is not used by an employee at the controls of moving equipment.
- Personal standalone calculator or digital watch whose only purpose is as a timepiece and medical devices that are consistent with railroad's standards as necessary in the performance of duties.
- In the cab of a controlling locomotive when stopped to reference a railroad rule, special instruction, timetable, or other directive provided the wireless capability of the device is disabled. (In Airplane Mode)

## #2

### 6.5 Shoving Movements

Equipment must not be shoved until the engineer and the crew member protecting the movement have completed a job safety briefing concerning how protection will be provided. When cars or engines are shoved and conditions require, the crew member protecting the movement must take an easily seen position on the leading car or engine, or be ahead of the movement, provide visual protection of the equipment being shoved and must not engage in unrelated tasks while providing protection.

Equipment must not be shoved until it is visually determined that:

- Portion of the track to be used is clear of equipment or conflicting movements.
- The track will remain clear to the location where the movement will be stopped.
- Switches and derails are properly lined.

Crew members assigned to protect shoving movements must be in a position to control the movement and must maintain constant communication with the locomotive engineer making the movement. The locomotive engineer must only take direction from the person controlling the movement and must STOP when no communication is received beyond one-half the distance last specified.

Under no circumstances are crew members relieved from providing visual protection when making a shoving movement. Cars or engines must not be shoved to block other tracks until it is safe to do so. Shoving movements made over road crossings must be made in accordance with Rule 6.32.1 (Providing Warning Over Road Crossings).

When cars are shoved on a main track or controlled siding in the direction authorized, movement must not exceed the maximum authorized speed for the location, and, in no instance can speed exceed 20 mph.

Movement MUST STOP within one-half the distance last specified unless additional instructions are received

#### **Application:**

When not using hand signals, radio job briefing must include the following:

- Who will protect the shove?
- Which track is to be shoved?
- How the shove will be protected.
- Distance and direction to be shoved.
- Position of switches and derails, if applicable.

## #3

### 6.28 Movement on Other Than Main Track

Except when moving on a main track, trains or engines must move at a speed that allows them to stop within half the range of vision short of:

- Train.
- Engine.
- Railroad car.
- Men or equipment fouling the track.
- Stop signal.  
or
- Derail or switch lined improperly.

Train must move at restricted speed and not exceed the maximum authorized speed for those tracks.

## #4

### 7.6 Securing Cars or Engines

Do not depend on air brakes to hold a train, engine or cars in place when left standing. A sufficient number of hand brakes must be applied to prevent movement, with a minimum of two brakes on cuts of multiple cars. Cuts in excess of two cars should have a sufficient number of additional brakes applied to secure the cut. Single cars may be secured with one hand brake. If hand brakes are not adequate, block the wheels.

Locomotives must be secured with a hand brake applied on each individual unit, regardless of whether coupled to one or more additional units.

When the engine is coupled to a train or cars standing on a grade, do not release the hand brakes until the air brake system is fully charged.

When cars are moved from any track, apply enough hand brakes to prevent any remaining cars from moving.

## #5

### 7.6.1 : Single Car Securement

A. Do not detach and leave a single car standing when the car can be coupled to and left secured with other equipment.

After performing a single car securement test as required below, a single car may only be left standing when:

- On a customer's industry track or within a customer's facility.
- In a yard equipped with derail protection.
- An articulated car is equipped with two hand brakes and both hand brakes are applied and functioning.
- The Car Department has chained the car to the rail.
- When leaving only two cars, both cars must be equipped with wheel or ratchet type brakes.
- B. When a single car will be left standing, perform the following steps in the order outlined to prevent uncontrolled movement.
- Apply all hand brakes on car to be set out.
- Move car a sufficient distance to ensure hand brake(s) are functioning properly (If brake system is charged, release air brake on car before moving.)
- Slowly bunch or stretch the slack at the coupler where uncoupling is to be made.
- Observe and verify car does not move for 1 minute. If movement is observed, set out an additional car and retest.

## #6

### 81.7.1 Designated Riding Places

When required to ride on cars, engines, or other equipment:

- Ride on designated steps, ladders, or platforms.
- Do not ride on side ladders leading to engine cabs.
- Maintain three-point contact (two feet and one hand or two hands and one foot). Maintain a firm grasp on the handhold and have feet solidly placed in stirrup or on ladder rung.
- Do not ride on end ladders or other end parts of moving cars.
- Do not sit with feet protruding over the sides or ends of cars or equipment.

## Critical Rules

When riding on the side of an engine, car, or other equipment, face the direction of the movement. Be alert to close clearance conditions in the direction of movement, such as gate support posts, gates, loading docks or racks, sides of buildings, hanging spouts, pipes, or cars on adjacent tracks. DO NOT ride a car into an area marked by signs indicating "Close Clearance" or "Will Not Clear Man on Top or Side of Car." Stop the movement and get off the equipment. Walk ahead a sufficient distance to observe the movement.

When moving over or in a street or highway crossing, do not ride on sill step, lower rung of ladders, or engine steps. Position yourself high enough on the side of the equipment so not to be struck by a highway vehicle that does not stop at a highway grade crossing.

### **Application for Riding Tank Cars**

Employees may only ride a tank car when the tank car is the first car of a shoving movement or the last car in a cut of cars being handled.

Employees must maintain three or four-point contact and:

When shoving:

- Be on leading end of leading car.
- Be positioned to ride behind the safety bar outside the gage of the track. On cars equipped with two vertical handholds or if unable to ride behind the safety bar, employee may ride on the outer portion of the crossover platform facing direction of movement, positioned outside the gauge of the track.
- Place both feet on the car to provide secure contact with the car. If unable to place both feet in a secure position, employee must not ride the car.
- When pulling:
- Place both feet on the car to provide secure contact with the car. If unable to place both feet in a secure position, employee must not ride the car.
- Be on the trailing end platform of the last car, facing the direction of movement. Place both feet on the end platform to provide secure contact with the car.



# #7

## 81.5.4: Fouling Equipment (REDZONE)

### What is Red Zone:

Anytime a Train, Engine or Yard employee is working within an area where there is the potential to be struck by moving equipment, crossing through equipment and/or fouling equipment.

Note: This applies to TE&Y employees only. All other crafts will be governed by their department's rules.

### When to Establish Red Zone:

Employees must establish protection before:

- Fouling equipment.
- Making adjustments to equipment.
- Crossing through cars.

### Who Must Establish Red Zone Protection:

Employees must establish protection with each crew member prior to entering the Red Zone when equipment is:

- Coupled to an occupied engine, or other motive equipment.
- On the same track as another occupied engine or equipment coupled to an occupied engine

Exceptions:

- Operating a uncoupling lever.
- Rule 5.13 is in effect.

### How to Establish Red Zone Protection:

#### 1. Request Red Zone:

Request over Radio: All Employee(s) requesting Red Zone must indicate the job ID or engine number and the track to be fouled.

#### 2. Actions Required Before Entering the Red Zone:

A. When equipment is attached to an occupied locomotive(s), the engineer or primary control operator must:

## Critical Rules

- Allow movement to stop and slack to adjust.
- Fully apply independent brakes and apply train airbrakes if necessary. (Brakes must not be released until all employees are clear of the Red Zone.)
- Center the reverser / direction selector
- Announce over the radio confirming job or locomotive id, red zone, set and centered condition, and name of the track to be protected. (i.e. "UP 2246, set and centered, track 6, over.")

B. When no occupied locomotive is on the track:

- Announce job ID and track to be fouled over the radio.

### **Performing Work in Red Zones in a Yard:**

Employees performing work in the Red Zone within a Yard must:

1. First communicate with job(s) near tracks to be fouled, and if necessary, contact yardmaster or employee in charge to ascertain which jobs are working. Do not establish a Red Zone if:
  - Cars will be kicked, shoved, or pulled from the track or tracks to be fouled.
2. Provide additional protection when necessary to make a coupler adjustment (81.13.2) by:
  - Waiting for the slack to adjust and know that all movement is stopped.
  - Tying a sufficient number of handbrakes, with a minimum of 2, on the end of the equipment closest to the employee working when it is not coupled to an occupied locomotive where a "set and centered" can be established.
  - If unable to secure the unattached portion, pull the equipment onto the lead to perform the work or have another employee be a lookout until work is completed.

### **Releasing Red Zone Protection:**

Crew Member on Ground:

- Each employee who established Red Zone Protection must announce by radio when they are clear of the red zone before movement can be made.

Crew Member at Controls:

- Engineer must confirm release of the Red Zone over the radio from all employees who requested Red Zone.

## #8

### 81.8.1 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. When machines, tools, material, or other equipment may foul adjacent tracks, notify the proper authority immediately.

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.

## #9

### 8.2 Position of Switches

The employee operating a switch or fixed derail is responsible for the position of the switch or fixed derail in use. Movement must not foul an adjacent track until the hand-operated switch or derail is properly lined.

**After lining a switch or when railcar or locomotives are moving over a switch, employees must stand at least 25 feet from the switch.**

Do not operate a switch that is tagged. If the switch is spiked, do not remove the spike unless authorized by the same craft or group that placed it.

Employees operating switches and derails must make sure:

- The switches and derails are properly lined for the intended route.
- The points fit properly and the target, if so equipped, corresponds with the switch's position.

- When the operating lever is equipped with a latch, they do not step on the latch to release the lever except when operating the switch.
- After locking a switch or derail, they test the lock to ensure it is secured.
- The switch is not operated while equipment is fouling, standing on or moving over the switch.
- When equipment has entered a track, the switch to that track is not lined away until the equipment has passed the clearance point of the track.

When possible, crew members on the engine must see that the switches and derails near the engine are properly lined.

## #10

### 8.20 Derail Location and Position

Employees in train, engine and yard service must know the location of all fixed derails. A train or engine moving on or entering tracks where fixed derails are located must stop at least 100 feet from the derail in derailing position. Movement must not continue until the derail is placed in the non-derailing position. Once movement is complete, derail must be returned to derailing position. However, the distance restriction will not apply in engine servicing areas.

Do not make a movement over a derail in derailing position.

Sidings having hand-thrown derails will have derail locked in the derailing position, except when engines or cars are left unattended on siding. On auxiliary tracks other than siding, except when derails are placed in non-derailing position to permit movement, make sure they are always in derailing position regardless of whether cars are on the track they are protecting. Lock all derails equipped with a lock.

Derails that are used in conjunction with Rule 5.13 (Blue Signal Protection of Workmen) or roadway worker protection must be in the derailing position only when their use is required for such protection. When their use is not required for protection:

- Remove the portable derails.

or

- Lock fixed derails in non-derailing position with an effective locking device.

# #11

## 81.2.2 Sufficient Distance

Maintain a safe distance from equipment and do not:

- Cross or step foul of tracks closely in front of or behind moving equipment or close to the end of equipment.
- Go between standing equipment if the opening is less than **100 feet**. (at TGS Cedar Port Industrial Park)
- Go between standing equipment if the opening is less than 50 feet. (at all other TGS sites)
- Cross tracks in front of or behind standing equipment unless there is at least 20 feet between the employee and the equipment.

In locomotive and car repair facilities where equipment has been spotted for repair, and the distance between that equipment or around the end of equipment is less than specified, employees may go between or around the equipment if the equipment is under Blue Signal Protection of Workmen in accordance with Railroad Operating Rule 5.13 and the employee knows that no movement will be made by the equipment.

# #12

## 8.12 Hand-Operated Crossover Switches

The normal position of crossover switches is for other than crossover movement. The crossover switches must be left lined in normal position, except when they are in use for crossover movements.

Both switches of a crossover shall be properly lined before equipment begins a crossover movement. A crossover movement shall be completed before either switch is restored to normal position, except when one crew is using both tracks connected by the crossover during continuous switching operations.

In Rule 6.13 (Yard Limits), Rule 6.14 (Restricted Limits) or Rule 6.28 (Movement on Other Than Main Track), crossover switches may be left out of correspondence while providing Blue Signal or Inaccessible Track protection. When protection is no longer required, the crossover switches connected to a main track or siding must be left lined for other than crossover movement. Crossover switches not connected to a main track must be left in a corresponding position.

## #13

### **7.10 Movement through gates or doorways**

Before moving engines, cars or other equipment through gates, doorways, or similar openings, stop to ensure that the gates, doorways, or openings are completely open and secure. When overhead or side clearances are close make sure movement is safe. Do not ride on side of a car, engine or other equipment when moving through gates, doorways, similar openings or on side of equipment moving adjacent to close clearances.

## #14

### **7.12 Movement into Spur (or Stub) Tracks**

When shoving cars into a spur (or Stub) track, control movement to prevent damage at the end of a track and the following:

- Stop movement 150 feet from the end of the track.
- Apply hand brakes, when necessary, to control slack.
- Have a crew member precede any further movement when it can be done safely.
- Move only on the crew member's signal.



## Railroad Operating Rules

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# **1 GENERAL RESPONSIBILITIES**

## **1.1 Safety**

Safety is the most important element in performing duties. Obeying the rules is essential to job safety and continued employment.

### **1.1.1 Maintaining a Safe Course**

In case of doubt or uncertainty, the safe course must be taken.

### **1.1.2 Alert and Attentive**

Employees must be careful to prevent injuring themselves or others. They must be alert and attentive when performing their duties and plan their work to avoid injury.

While working at any rail operation, employees must be constantly alert to changes in their work environment. *Rail car movement can occur at any time, from any direction and on any track.* This unexpected movement requires that all crew members communicate with each other, any condition that affects the safety of any person. Members of other crews or work gangs must notify the proper authority immediately upon discovery of any condition that affects the safety of another crew or work gang.

### **1.1.3 Accidents, Injuries, and Defects**

Report by the first means of communication any accidents; personal injuries; defects in tracks, bridges or signals; or any unusual condition that may affect the safe and efficient operation of the railroad. Where required, furnish a written report promptly after reporting the incident.

### **1.1.4 Condition of Equipment and Tools**

Employees must check the condition of equipment and tools they use to perform their duties. Employees must not use defective equipment or tools. Employees must report any defects to the proper authority.

## **1.2 Personal Injuries and Accidents**

### **1.2.1 Care for Injured**

When employees are injured, do everything possible to care for them.

### **1.2.2 Witnesses**

If equipment is involved in personal injury, loss of life or damage to property, the employee in charge must immediately secure the names, addresses and occupations of all persons involved, including all persons at the scene when the accident occurred and those that arrived soon after. The employee in charge must secure the names regardless of whether these persons admit knowing anything about the accident.

The employee in charge must also obtain the license numbers of nearby automobiles. When necessary, other employees can assist in obtaining this information, which must be included in reports covering the incident.

Where signaling devices are provided or a flagman is on duty, the employee in charge and assisting employees must try to determine who, among the witnesses, can testify whether the signaling devices were functioning properly or if the flagman was performing his duties properly.

When possible, obtain the names of witnesses who can testify about the bell and whistle signals.

### **1.2.3 Equipment Inspection**

If an accident results in personal injury or death, all tools, machinery and other equipment involved, including accident site, must be inspected promptly by the foreman, another person in charge of the work or other competent inspectors. The inspector must promptly forward to his manager a report of the inspection. The report must include the condition of the equipment and the names of those making the inspection.

If requested by the safety department, the equipment inspected must be marked for identification and placed in custody of the responsible manager or employee.

### **1.2.4 Mechanical Inspection**

When engines, cars or other equipment are involved in an accident that results in personal injury or death, the equipment must be inspected before it leaves the accident site.

A mechanical department employee must further inspect the equipment at the first terminal. This employee must promptly report inspection results to the proper manager.

### **1.2.5 Reporting**

All cases of personal injury, while on duty, or while on company property, must be immediately reported to the proper manager and the prescribed form completed.

A personal injury that occurs while off duty that will in any way affect employee performance of duties must be reported to the proper manager as soon as possible. The injured employee must also complete the prescribed written form before returning to service.

If an employee receives a medical diagnosis of occupational illness, the employee must report it immediately to the proper manager.

### **1.2.6 Statements**

Except when authorized by the proper manager:

1. Information concerning accidents or personal injuries that occur to persons other than employees may be given only to an authorized representative of the railroad or an officer of the law.
2. Information about the facts concerning the injury or death of an employee may be given only to the injured employee, an immediate relative of the injured or deceased employee, an authorized representative of the railroad or an officer of the law.
3. Information in the files or in other privileged or confidential reports of the railroad concerning accidents or personal injuries may be given only to an authorized representative of the railroad.

### **1.2.7 Furnishing Information**

Employees must not withhold information or fail to give all the facts to those authorized to receive information regarding unusual events, accidents, personal injuries or rules violations.

## **1.3 Rules**

### **1.3.1 Rules, Regulations, and Instructions**

**Safety Rules.** Employees must have a copy they can refer to while on duty. Employees must also be familiar with and comply with all safety rules issued in a separate book or in another form.



**Railroad Operating Rules.** Employees governed by these rules must have a current copy they can refer to while on duty.

**Hazardous Materials.** Employees who in any way handle hazardous materials must have a copy of the instructions or regulations for handling these materials, that they can refer to while on duty. Employees must be familiar with and comply with these instructions or regulations.

**Air Brakes.** Employees whose duties are affected by air brake operation must have a copy of the rules and instructions for operating air brakes and train handling. Employees must know and obey these rules and instructions.

**Special Instructions/General Orders** - Employees whose duties are affected by special instructions or general orders, must have a current copy of the instruction or order that specifically impacts their work or work location. The information must be available to refer to while on duty.

**Classes.** Employees must be familiar with and obey all rules, regulations and instructions and must attend required classes. They must pass the required examinations.

**Explanation.** Employees must ask their supervisor for an explanation of any rule, regulation, or instruction they are unsure of.

**Issued, Cancelled or Modified.** Rules may be issued, cancelled, or modified by general orders or special instructions.

### 1.3.2 General Orders

General orders:

1. Are numbered consecutively.
2. Are issued and cancelled by the Director or Railroad Safety or Director of Corporate Safety.
3. Contain only information and instructions related to rules and operating practices.
4. Replace any rule, special instruction or regulation that conflicts with the general order.

Before beginning each day's work or trip, crew members and any others whose duties require, must review general orders that apply to the territory they will work on.

### **1.3.3 Circulars, Instructions, and Notices**

Circulars, bulletins, instructions, notices, and other information are issued and cancelled by the designated manager. Before beginning each day's work or trip, all employees whose duties require, must review those that apply to the location where they are assigned.

## **1.4 Carrying Out Rules and Reporting Violations (Good Faith Challenge)**

Employees must cooperate and assist in carrying out the rules and instructions. They must promptly report any violations to the proper supervisor. They must also report any condition or practice that may threaten the safety of trains or employees and any misconduct or negligence that may affect the interest of the railroad.

### **A. Right to Challenge**

Federal regulations have provisions that allow an employee the right to challenge a directive which, based upon the employee's good faith determination, would violate a railroad operating rule relating to:

- Shoving movements.
- Leaving equipment foul of an adjacent track(s).
- or
- Handling of hand-operated switches or fixed derails.

### **B. Good Faith Challenge Procedure**

1. An employee may inform a supervisor issuing a directive that a good faith determination has been made that the directive would violate a railroad operating rule relating to:
  - Shoving movements.
  - Leaving equipment foul of an adjacent track(s).
  - or
  - Handling of hand-operated switches or fixed derails.

2. The supervisor will not require the employee to comply with the directive until the challenge is resolved. The supervisor may:
  - Require the challenging employee to perform other tasks not related to the challenge until the challenge is resolved.
  - or
  - Direct an employee, other than the challenging employee, to perform the challenged task before the challenge is resolved. The employee so directed will be informed of the challenge and determine that the challenged task does not violate the rules.

### **C. Resolving Good Faith Challenge**

1. A challenge may be resolved by one of the following:
  - The supervisor's acceptance of the employee's request.
  - An employee's acceptance of the directive.
  - An employee's agreement to a compromise solution acceptable to the person issuing the directive.
2. If the challenge cannot be resolved because the supervisor issuing the directive has determined that the employee's challenge has not been made in good faith or there is no alternative to the direct order, the railroad will:
  - Provide immediate review by at least one manager, which must not be conducted by the supervisor issuing the challenged directive or that supervisor's subordinate.
  - Resolve the challenge using the same options available for resolving the challenge as the initial supervisor.
3. If the manager making the final decision concludes that the challenged directive would not cause the employee to violate any requirement of the involved rules, the reviewing manager's decision shall be final and not subject to further immediate review.
  - The manager will inform the employee that federal law may protect the employee from retaliation, if the employee's refusal to do the work is a lawful, good faith act.

- The employee making the challenge will be afforded an opportunity to document, in writing or electronically, any protest to the manager making the final decision before the employee's tour of duty is complete. The employee will be afforded the opportunity to retain a copy of the protest.

#### **D. Request for Review and Verification of Decision**

Upon written request, at the time of the challenge, the employee has the right for further review by the "Designated Review Manager". Within 30 days after the expiration of the month during which the challenge occurred, the "Designated Review Manager" will verify the proper application of the rule in question. The verification decision shall be made in writing to the employee.

#### **E. Employee Rights and Remedies**

The Good Faith Challenge is not intended to abridge any rights or remedies available to the employee under any Federal law.

### **1.5 Drugs and Alcohol**

The use or possession of alcoholic beverages while on duty or on company property is prohibited. Employees must not have any measurable alcohol in their breath or in their bodily fluids when reporting for duty, while on duty or while on company property.

The use or possession of intoxicants, over-the-counter or prescription drugs, narcotics, controlled substances or medication that may adversely affect safe performance is prohibited while on duty or on company property, except medication that is permitted by a medical practitioner and used as prescribed. Employees must not have any prohibited substances in their bodily fluids when reporting for duty, while on duty or while on company property.

### **1.6 Conduct**

Employees must not be:

1. Careless of the safety of themselves or others.
2. Negligent.
3. Insubordinate.
4. Dishonest.

5. Immoral.
6. Quarrelsome.
- or
7. Discourteous.

Any act of hostility, misconduct or willful disregard or negligence affecting the interest of the company or its employees is cause for dismissal and must be reported. Indifference to duty or to the performance of duty will not be tolerated.

**Motor Vehicle Driving Records:** A certified conductor, locomotive engineer or person seeking initial certification convicted for operating a motor vehicle under the influence of/impaired by alcohol or a controlled substance must report the conviction to their supervisor within 48 hours of being notified.

As applied to this rule, a conviction also includes:

- Refusal to undergo such testing when a law enforcement official seeks to find out whether a person is operating under the influence of/impaired by alcohol or a controlled substance.
- Participation in a state sponsored diversion program, guilty pleas and completed state actions to cancel, revoke, suspend or deny a driver's license.

## **1.7    *Altercations***

Employees must not enter into altercations with each other, play practical jokes or wrestle while on duty or on railroad property.

## **1.8    *Appearance***

Employees reporting for duty must be clean and neat, and represent the company in a professional manner. They must wear the prescribed uniform when required.

## **1.9    *Respect of Railroad Company***

Employees must behave in such a way that will not be detrimental to the TGS brand, and the customers they serve.

## **1.10   *Reserved***

### **1.11 *Sleeping on Duty***

Employees must not sleep while on duty. Employees reclined with their eyes closed, covered, or concealed will be in violation of this rule.

### **1.12 *Weapons***

While on duty or on railroad property, employees must not have firearms or other deadly weapons, including knives with a blade longer than 3 inches. Employees may possess these weapons only if they are authorized to use them to perform their duties, and given permission by an Executive of the company.

### **1.13 *Reporting and Complying with Instructions***

Employees will report to and comply with instructions from supervisors who have the proper jurisdiction. Employees will comply with instructions issued by managers of various departments when the instructions apply to their duties.

### **1.14 *Employee Jurisdiction***

Employees are under the jurisdiction of the supervisors of the railroad they are operating on.

When operating on another railroad, unless otherwise instructed, employees will be governed by:

- Safety rules, air brake and train handling rules and hazardous materials instructions of the railroad they are employed by.
- The operating rules, timetable and special instructions of the railroad they are operating on.

### **1.15 *Duty – Reporting or Absence***

Employees must report for duty at the designated time and place with the necessary equipment to perform their duties. They must spend their time on duty working only for the railroad. Employees must not leave their assignment, exchange duties, or allow others to fill their assignment without proper authority.

### **1.16 *Subject to Call***

Employees subject to call must indicate how they can be reached and must not be absent from call without notifying those required to call them.

## **1.17 Hours of Service Law**

Employees must be familiar and comply with the requirements of the federal hours of service law. Employees are expected to use off-duty time so they are prepared for work. If an employee is called to report for duty before legal off-duty time has expired, before accepting the call to work, the employee must notify the individual making the call that off-duty time has not expired.

### **A. Notification**

When communication is available, employees must notify the proper authority of the time the law requires them to be off duty. Employees must provide notification early enough that they may be relieved, or transportation provided, before they exceed the federal hours of service law.

### **B. Exceeding the Law**

Employees must not exceed the federal hours of service law without proper authority. However, they must not leave trains, engines, or cars on the main track without proper protection. Employees must secure trains properly, if possible, before they exceed the federal hours of service law.

## **1.18 Unauthorized Employment**

Employees must not engage in another business or occupation that would create a conflict of interest with their employment on the railroad or would interfere with their availability for service or the proper performance of their duties.

## **1.19 Care of Property**

Employees are responsible for properly using and caring for railroad property and must not use railroad property for their personal use. Employees must return the property when the proper authority requests them to do so.

## **1.20 Alert to Train Movement**

Employees must expect the movement of trains, engines, cars or other movable equipment at any time, on any track and in either direction.

Employees must not stand on the track in front of an approaching engine, car or other moving equipment.

Employees must be aware of the location of structures or obstructions where clearances are close.

### **1.21 *Occupying Roof***

Employees whose duties require them to occupy the roof of a car or engine must do so only with proper authority and when the equipment is standing.

### **1.22 *Not Permitted on Equipment***

Do not permit unauthorized persons on equipment.

Promptly notify proper authority when unauthorized persons or emergency responders are observed on, under or between railroad equipment.

When made aware of emergency responders on, under or between railroad equipment, the supervisor or proper authority must arrange for a qualified employee to inspect all affected equipment to verify proper securement as soon as practical.

### **1.23 *Altering Equipment***

Without proper authority, employees must not alter, nullify, change the design of or in any manner restrict or interfere with the normal function of any device or equipment or engines, cars or other railroad property, except in the case of an emergency. Employees must report to the proper supervisor changes made in an emergency.

### **1.24 *Clean Property***

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.

### **1.25 *Credit or Property***

Unless specifically authorized, employees must not use the railroad's credit and must not receive or pay out money on the railroad account. Employees must not sell or in any way get rid of railroad property without proper authority. Employees must care for all articles of value found on railroad property and promptly report the articles to the proper authority.

### **1.26 *Gratuities***

Employees must not discriminate among railroad customers. Employees must not accept gifts or rewards from customers, suppliers or contractors engaged by the railroad.



## **1.27 *Divulging Information***

Employees who make up, handle or care for any of the following must not allow an unauthorized person to access them or disclose any information contained therein:

- Correspondence.
- Reports.
- Books.
- Bills of Lading.
- Waybills
- Tickets.
- Statistics.
- Or any information not previously stated

## **1.28 *Loss and Damage by Fire***

Employees must take every precaution to prevent loss and damage by fire.

Employees must report promptly to the proper authority any fires seen on or near the right of way, unless the fires are being controlled. If there is danger of the fire spreading to a bridge or other structure, crew members must stop their train and help extinguish the fire.

Cause of fire, if known, must be promptly reported.

## **1.29 *Avoiding Delays***

Crew members must operate trains and engines safely and efficiently. All employees must avoid unnecessary delays.

When possible, train or engine crews wanting to stop the train to eat must ask the proper authority at least thirty minutes before the desired stop.

## **1.30 *Riding Engine***

When possible, the conductor will ride in the control compartment of the lead locomotive.

### **1.31 Repairs to Foreign Cars**

Members of train crews who make repairs to foreign cars must report the repairs on the prescribed form.

### **1.32 Overheated Wheels**

When overheated wheels are identified, the work must stop and the car or cars in question must be inspected immediately and reported to a supervisor.

### **1.33 Inspection of Freight Cars**

When inspection is required the inspection must include the following:

- Cars must be checked for:
  - Leaning.
  - Sagging.
  - Improper position (off-center) on the truck.
  - Objects hanging or dragging from the car or extending from the side.
  - Insecurely attached doors.
  - Broken or missing safety appliances.
  - Contents leaking from placarded hazardous material car.
  - Insecure coupling device.
  - Overheated wheel or journal.
  - Broken or cracked wheel.
  - Brake that fails to release.
  - Staff type brake not in fully raised position.
  - Any apparent hazard that could cause an accident.
- Open top loads, including trailers and containers on flat cars, must be loaded safely.
- If the width or height approaches clearance restrictions, movement must be cleared with the proper authority.

A freight car with any defect that makes movement unsafe must be corrected or set out of the train.

A freight car with three bad order tags indicating that the car is safe to move may be moved to the nearest car repair point. The conductor will remove one bad order tag from the side with two tags. The conductor will use this written information from the tag to inform other crew members of the restrictions.

### **1.34 Flat Spots**

If a wheel on a piece of equipment has a flat spot more than 2 ½ inches long, or if the wheel has adjoining flat spots that are each at least 2 inches long, the equipment must not be moved faster than 10 mph. Such equipment must be set out at the first available point.

### **1.35 Dump Doors**

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

### **1.36 Excessive Dimension Loads**

Place excessive dimension loads on or near the head end of trains.

Instructions will be issued to trains handling excessive dimension loads. If no instructions have been issued regarding handling the car, the conductor will immediately notify the proper authority.

Crew members handling excessive dimension equipment must ensure that the equipment will clear nearby objects, including equipment on adjacent tracks. If the train cannot reach a point with enough clearance, crew members must make sure protection is provided against movements on adjacent tracks.

### **1.37 Open Top Loads**

Flat cars, open top cars and open top TOFC/COFC equipment with loads that are likely to shift must not be placed in trains next to the following if train length and makeup permit:

- Engine.
- Shipment of automotive vehicles and machinery that is not fully enclosed.

This restriction does not apply to cars with permanent tie-downs.

### **1.38 Shipments Susceptible to Damage**

Shipments with painted or finished surfaces susceptible to damage (such as automobiles, trucks, tractors, combines and other similar equipment or machinery) must not be placed closer than the fifth car behind open top cars loaded with commodities such as coal, sand, gravel, lime, soda ash, etc. subject to wind, vapor or fume action of adjacent cars. Exceptions include shipments susceptible to damage that are:

- Loaded in cars that fully enclose the shipments
- or
- Fully protected by a covering.

### **1.39 Reserved**

### **1.40 Reporting Engine Defects**

The engineer will report any engine defect on the prescribed form and notify the relieving engineer, when needed. The engineer will not operate any engine that has a non-complying defect condition, until that condition is corrected.

### **1.41 Reserved**

### **1.42 Reserved**

### **1.43 Reserved**

### **1.44 Reserved**

### **1.45 Reserved**

### **1.46 Duties of Yardmasters**

The yardmaster is responsible for and shall directly supervise yard crews, clerks and all other employees working in the yard. The yardmaster must see that they work in a safe, efficient, and economical manner, according to the rules, regulations and instructions of the railroad. Yardmasters must ensure the prompt and regular movement of cars, especially the proper makeup of trains and their movement into and out of the yard.

At locations where yardmasters are on duty, employees in train, engine and yard service must comply with the yardmaster's instructions. At locations where no yardmaster is on duty, these employees will work according to the instructions of designated employees.

## **1.47 Duties of Crew Members**

The conductor and the engineer are equally responsible for the safety and protection of their train and observance of the rules. They must ensure that their subordinates are familiar with their duties, determine the extent of their experience and knowledge of the rules. They must instruct them, when necessary, how to perform their work properly and safely. If any conditions are not covered by the rules, they must take every precaution to provide protection.

### **A. Conductor Responsibilities**

1. The conductor supervises the operation and administration of the train. All persons employed on the train must obey the conductors' instructions, unless the instructions endanger the train's safety or violate the rules. If any doubts arise concerning the authority for proceeding or safety, the conductor must consult with the engineer who will be equally responsible for the safety and proper handling of the train. Certified conductors must have a current certificate in their possession while on duty.
2. The conductor must advise the engineer of any restriction placed on equipment being handled.
3. When the conductor is not present, other crew members must obey the instructions of the engineer concerning rules, safety and protection of the train.
4. Conductors are responsible for the freight carried by their train. They are also responsible for ensuring that the freight is delivered with any accompanying documents to its destination or terminals. Conductors must maintain any required records.

### **B. Engineer Responsibilities**

1. The engineer is responsible for safely and efficiently operating the engine. Crew members must obey the engineer's instructions that concern operating the engine. A student engineer or other qualified employee may operate the engine under close supervision of the engineer. Any employee that operates an engine must have a current certificate in their possession.
2. The engineer must check with the conductor to determine if any cars or units in the train require special handling.

### **C. All Crew Members' Responsibilities**

1. To ensure the train is operated safely and rules are observed, all crew members must act responsibly to prevent accidents or rules violations. Crew members in the engine control compartment must communicate to each other any restrictions or other known conditions that affect the safe operation of their train sufficiently in advance of such condition to allow the engineer to take proper action. If proper action is not being taken, crew members must remind the engineer of such condition and the required action.
2. When the engineer and/or conductor fail to comply with any signal or take proper action to comply with a restriction or rule, or an emergency requires, crew members must immediately take action to ensure safety, using the emergency brake valve to stop the train, if necessary.

### **1.48 Reserved**

## **2 RAILROAD RADIO & COMMUNICATION RULES**

### **2.1 Transmitting**

Any employee operating a radio must do the following:

- Before transmitting, listen long enough to make sure the channel is not being used.
- Give the required identification.
- Not proceed with further transmission until acknowledgement is received.

### **2.2 Required Identification**

Employees transmitting or acknowledging a radio communication must begin with the required identification.

The identification must include the following in this order:

- For base or wayside stations:
  - Name or initials of the railroad.
  - Name and location or other unique designation.

- For mobile units:
  - Name or initials of the railroad.
  - Locomotive initial and number or job number. For mobile units, use words that identify the precise mobile unit.

If communication continues without interruption, repeat the identification every 15 minutes.

### **Short Identification**

After making a positive identification for switching, classification and similar operations within a yard, fixed and mobile units may use a short identification after the initial transmission and acknowledgment. For example “Job 1”.

## **2.3 Repetition**

An employee who receives a transmission must repeat it to the person transmitting the message, except when the communication:

- Concerns switching operations.
- Is a recorded message from an automatic alarm device.
- Is general and does not contain any information, instruction or advice that could affect the safety of a railroad operation.

## **2.4 Ending Transmissions**

Employees using a radio for transmissions must state to the employee receiving the transmission the following as it applies to indicate the communication has ended or is completed:

“OVER” – when a response is expected.

or

“OUT” preceded by required identification – when no response is expected.

However, these requirements do not apply to yard switching operations.

## **2.5 Communication Redundancy**

The controlling unit on any train that requires an air brake test must be equipped with an operative radio, unless relieved by Rule 2.18 (Malfunctioning Radio). In addition, trains must have a second means of communication, which may include:

- An operative radio on any unit in the consist.
- or
- A portable radio.

## **2.6 Communication Not Understood or Incomplete**

An employee who does not understand a radio communication or who receives a communication that is incomplete must not act upon the communication and must treat it as if it was not sent.

**EXCEPTION:** An employee who receives information that may affect the safety of employees or the public or cause damage to property must take the safe course. When necessary, stop movement until the communication is understood.

## **2.7 Monitoring Radio Transmissions**

Radios in attended base stations or mobile units must be turned on to the appropriate channel with the volume loud enough to receive communications. Employees attending base stations or mobile units must acknowledge all transmissions directed to the station or unit.

## **2.8 Acknowledgment**

An employee receiving a radio call must acknowledge the call immediately, unless doing so would interfere with safety.

## **2.9 Misuse of Radio Communications**

Employees must not use radio communication to avoid complying with any rule.

## **2.10 Emergency Calls**

Emergency calls will begin with the words “Emergency, Emergency, Emergency.” These calls will be used to cover initial reports of hazardous conditions which could result in death or injury, damage to property or serious



disruption of railroad operations such as:

- Derailments.
- Collisions.
- Storms.
- Washouts.
- Fires.
- Track obstructions.

Emergency calls must contain as much complete information on the incident as possible.

All employees must give absolute priority to an emergency communication. Unless they are answering or aiding the emergency call, employees must not transmit until they are certain no interference will result.

## **2.11 Prohibited Transmissions**

Employees must not transmit a false emergency, or an unnecessary or unidentified communication. Employees must not use indecent language over the radio. Employees must not reveal the existence, contents or meaning of any communication (except emergency communications) to persons other than those it is intended for or those whose duties may require knowing about it.

## **2.12 Fixed Signal Information**

Employees must not use the radio to give information to a train or engine crew about the name, position, aspect or indication displayed by a fixed signal, unless the information is given between members of the same crew or the information is needed to warn of an emergency.

## **2.13 In Place of Hand Signals**

When the radio is used instead of hand signals, information must include the direction and distance to be traveled.

<p><b>Movement MUST STOP within one-half of the distance last specified unless additional instructions are received.</b></p>
--

## **2.14 Reserved**

## **2.15 *Phonetic Alphabet***

If necessary, a phonetic alphabet (Alpha, Bravo, Charlie, etc.) will be used to pronounce clearly any letter used as an initial, except initial letters of railroads.

## **2.16 *Assigned Frequencies***

The railroad must authorize any radio transmitters used in railroad service. Radio transmitters must operate on frequencies the Federal Communications Commission assigns the railroad. Employees are prohibited from using other transmitters or railroad frequencies not assigned to that particular location.

## **2.17 *Radio Testing***

Radios used in train operation, outside of a yard, must be tested at the point where the train is originally made up.

Engineers and conductors must test the radios at the beginning of each tour of duty, to verify the radios are working.

The radio test must include an exchange of voice transmissions with another radio. The test must confirm the quality of the radio transmission.

## **2.18 *Malfunctioning Radio***

Malfunctioning radios must not be used. As soon as possible, notify each crew member and the proper authority or other affected employees that the radio is not working.

## **2.19 *Blasting Operations***

Employee must not operate radio transmitters located less than 250 feet from blasting operations.

## **2.20 *Internal Adjustments***

Employees are prohibited from making internal adjustments to a railroad radio unless they are specifically authorized by the FCC or hold a current Certified Technicians Certificate. Employees authorized to make adjustments must carry their FCC operator license, Certified Technicians Certificate or verification card while on duty.

## **2.21 Games, Reading, or Electronic Devices**

Employees on duty must not:

- Play games.
  - Use personal electronic devices.
- or
- Read magazines, newspapers or other literature not related to their duties when:
    - Performing safety related activities.
- or
- It would delay or interfere with required duties.

This does not prohibit employees from having such material enclosed in their personal luggage while performing safety related activities.

### **Electrical Devices**

The restrictions in this rule apply to use of personal and railroad-supplied electronic devices by railroad operating employees and does not affect the use of railroad radios under FRA regulations. A railroad operating employee must not use an electronic device that would interfere with the performance of safety related duties. Electronic devices must not be used to verbally obtain or release a mandatory directive when radio communication is available.

Crewmembers are jointly responsible for compliance with the appropriate use of electronic devices.

### **Railroad Supplied Electronic Devices**

When required to be powered on for purposes of timely, automated updating or transmission of information, railroad-supplied electronic devices must be powered on. These devices may be used for exchange of work-related information during train or switching operations with railroad supervisors.

Crew members authorized to use railroad-supplied electronic devices may use such devices when:

- A job briefing is held, and all crewmembers agree the device is safe to use.
- Not on a moving train.
- The crewmember using the device is not fouling the track. (within 4 feet of nearest rail)

### Prohibited Use

Personal electronic devices are prohibited from use while on duty in safety-related situations and must be **TURNED OFF AND STOWED with any earpiece removed from the ear**. Use by any crew member in the cab of a controlling locomotive is prohibited when:

- On a moving train (except as described below under Permitted Use).
- Any member of the crew is on the ground or on moving equipment.
- Any railroad employee or authorized individual is inspecting or assisting in preparation of the train, engine, or on-track equipment for movement

### Permitted Use

Use of a personal electronic device at any time must not result in delays or interfere with safety-related duties of any crewmember, other employees, or personnel. After conducting a safety briefing and agreeing the use of the device is safe, a personal electronic device may be used as follows:

- Responding to an emergency involving the operation of the railroad, an emergency encountered on duty, or when necessary due to a radio malfunction.
- A camera may be used to take a photograph of a safety hazard or a violation of a rail safety law, regulation, order, or standard provided it is a standalone camera. A camera that is part of a cell phone or other similar multi-functional electronic device is not included in this exception unless it is a railroad-supplied device and is used for an authorized business purpose. The camera must be turned off immediately after the photograph is taken and the camera is not used by an employee at the controls of moving equipment.
- Personal standalone calculator or digital watch whose only purpose is as a timepiece and medical devices that are consistent with railroad's standards as necessary in the performance of duties.
- In the cab of a controlling locomotive when stopped to reference a railroad rule, special instruction, timetable, or other directive provided the wireless capability of the device is disabled. (In Airplane Mode)

## 3 STANDARD TIME

*Reserved*

## 4 TIMETABLES

*Reserved*

## **5 SIGNALS AND THEIR USE**

### **5.1 *Signal Equipment***

Employees who give or display signals must have the proper appliances. Appliances must be in good condition and ready to use.

### **5.2 *Receiving and Giving Signals***

#### **5.2.1 Looking for signals**

To recognize and follow signals correctly, employees must:

1. Always be on the lookout for signals.
2. Comply with the intent of the signal.
3. Not act on any signal that they do not understand or that may be intended for other trains or engines.

#### **5.2.2 Signals Used by Employees**

To give clear signals during the day and at night, employees must:

##### **A. During the Day**

1. Use the correct color flags or lights.
2. Use day signals from sunrise to sunset.
3. Flagmen providing protection as outlined in Rule 6.19 (Flag Protection) must have a red flag.

##### **B. At Night**




1. Use the correct color of reflectorized flags or lights.
2. Use night signals from sunset to sunrise or when day signals cannot be seen clearly.

Flags may be made from cloth, metal or other suitable material.

## 5.3 Hand and Radio Signals

### 5.3.1 Hand Signals

The following diagram illustrates the hand signals for a train or engine to stop, proceed or back up.

Description of Signal	Indication	Movement
1. Swung at a right angle to the track	STOP	
2. Raised and lowered vertically	PROCEED	
3. Swung slowly in a circle at a right angle to the track	BACK UP	

*[Diagram A.]*

Employees may use other hand signals only if all crew members understand the signals. When employees are not giving hand signals, they must not make any gestures or movements that may resemble a hand signal.

### 5.3.2 Giving Signals

Employees who give signals must:

1. Make sure signals can be plainly seen.
2. Give signals clearly so they can be understood.
3. Give signals on the engineer's side of the track when practical.

### 5.3.3 Signal Disappearance

If a person disappears who is giving the signal to back or shove a train, engine or car, or the light being used disappears, employee must stop movement unless employee on leading car controls the air brakes.

#### **5.3.4 Signal to Stop**

**Any object waved violently by any person on or near the track is a signal to stop.**

#### **5.3.5 Acknowledge Stop Signal**

Acknowledge any signal to stop a train unless it is a fixed signal. When flagged, the engineer must obtain a thorough explanation from the flagman before proceeding.

#### **5.3.6 Radio and Voice Communication**

Employees may use radio and other means of voice communication to give information when using hand signals is not practical. Employees must make sure crew members:

1. Know which moves will be made by radio communication.
2. Understand that while using the radio, the engineer will not accept any hand signals, unless they are Stop signals.

#### **5.3.7 Radio Response**

When radio communication is used to make movements, crew members must respond to specific instructions given for each movement. Radio communications for shoving movements must specify the direction and distance and must be acknowledged when distance specified is more than four cars.

**Movement MUST STOP within half the distance last specified unless additional instructions are received.**

### ***5.4 Flags for Temporary Track Conditions***

#### **5.4.1 Temporary Restrictions**

Work limit order will restrict train movement because of track conditions or men and/or equipment working. A red flag or red light will be displayed where trains must stop.

#### **5.4.2 Reserved**

#### **5.4.3 Reserved**

#### **5.5.4 Reserved**

#### **5.4.5 Reserved**

#### **5.4.6 Reserved**

#### **5.4.7 Display of Red Flag or Red Light**

A red flag or red light is displayed where trains must stop. When approaching a red flag or red light, the train must stop short of the red flag or red light and not proceed unless the employee in charge gives verbal permission. If permission to proceed is received before the train stops, the train may pass the red flag or red light without stopping.

**Displayed Between Rails.** When a red flag or red light is displayed between the rails of a track other than a main track or controlled siding, the train must stop and not proceed until the flag or light has been removed by an employee of the class that placed it.

#### **5.4.8 Reserved**

### **5.5 *Reserved***

### **5.6 *Reserved***

### **5.7 *Reserved***

## **5.8 *Bell and Whistle Signals***

#### **5.8.1 Ringing Engine Bell**

Ring the engine bell under any of the following conditions:

- Before moving, except when making momentary stop and start switching movements.
- As a warning signal anytime it is necessary.
- When approaching men or equipment on or near the track.
- Approaching public crossings at grade with the engine in front, as follows:
  - If distance permits, ringing must begin at least  $\frac{1}{4}$  mile before the public crossing and continue until the crossing is occupied.
  - or
  - If distance does not permit, ringing must begin soon enough before the crossing to provide a warning and continue until the crossing is occupied.



### 5.8.2 Sounding Whistle

The whistle may be used at any time as a warning regardless of any whistle prohibitions. If the whistle fails, ring the bell continuously while moving. When weather conditions impair visibility, sound the whistle frequently and ring the bell continuously.

When other employees are working in the immediate area, sound the required whistle signal before moving. The bell must be rung continuously while moving through the working limits of roadway workers.

The radio may be used in place of whistle signals, except signals (1), (8) and (9). See Diagram B on next page. The required whistle signals are illustrated by “o” for short sounds and “—” for longer sounds:

Sound		Indication
(1)	Succession of short sounds	Use when persons or livestock are on the track at other than road crossings at grade. In addition, use to warn railroad employees when an emergency exists, such as a derailment. When crews on other trains hear this signal, they must stop until it is safe to proceed.
(2)	—	When stopped: air brakes are applied, pressure equalized.
(3)	— —	Release brakes. Proceed.
(4)	o o	Acknowledgment of any signal not otherwise provided for.
(5)	o o o	When stopped, back up. Acknowledgment of hand signal to back up.
(6)	o o o o	Request for signal to be given or repeated if not understood.
(7)	— — o —	Approaching public road crossings at grade with engine in front, start signal not less than ¼ mile before reaching crossing, if distance permits. If distance does not permit, begin signal soon enough in advance of crossing to provide warning. Prolong or repeat signal until engine occupies crossing. <b>Used when approaching working limits of roadway workers or whenever view is limited or restricted.</b>
(8)	o —	Inspect brake system for leaks or sticking brakes.
(9)	— o	Approaching men or equipment on or near the track, regardless of any whistle prohibitions. After this initial warning, sound whistle signal (4) intermittently until the head end of train has passed the men or equipment.

[Diagram B.]

### **5.8.3 Whistle Failure**

If the whistle fails to operate and no other unit can be used as the lead unit, continue movement with the bell ringing continuously. Stop the train before each public crossing, so a crew member on the ground can provide warning until the crossing is occupied, unless:

- Crossing gates are in the fully lowered position.
- or
- No traffic is approaching or stopped at the crossing.

## **5.9 Headlight Display**

Turn the headlight on bright to the front of every train, except when the light must be dimmed as defined by site specific instructions.

### **5.9.1 Reserved**

### **5.9.2 Reserved**

### **5.9.3 Headlight Failure**

If the headlight on the train fails, ditch lights must be on, when so equipped. Headlight failure must be reported to the proper authority.

At night, if headlight and ditch lights fail to operate and no other unit can be used as the lead unit, continue movement with a white light displayed on the lead unit. Stop the train before each public crossing, so a crew member on the ground can provide warning until the crossing is occupied, unless:

- Crossing gates are in the fully lowered position.
- or
- No traffic is approaching or stopped at the crossing.

### **5.9.4 Displaying Headlights Front and Rear**

When engines are moving, crew members must turn on the headlight to the front and rear but may dim or extinguish it on the end coupled to cars.

### **5.9.5 Displaying Ditch Lights**

Display ditch lights, if available, to the front of the train when the headlight is on bright when operating over a road crossing.

### **5.9.6 Reserved**

### **5.9.7 Reserved**

### **5.9.8 Displaying Cab Roof Light**

If engine is equipped with an amber or white cab roof light that revolves or flashes, display the light on the occupied controlling unit.

## **5.10 *Reserved***

## **5.11 *Reserved***

## **5.12 *Reserved***

## **5.13 *Blue Signal Protection of Workmen***

This rule outlines the requirements for protecting railroad workmen who are inspecting, testing, repairing and servicing rolling equipment. In particular, because these tasks require the workmen to work on, under or between rolling equipment, workmen are exposed to potential injury from moving equipment.

As used in this rule, the following definitions apply:

**Workmen.** Railroad employees assigned to inspect, test, repair or service railroad rolling equipment or components, including air brake systems. Train and yard crews are excluded, except when they perform the above work on rolling equipment not part of the train or yard movement they are handling or will handle.

- “Servicing” does not include supplying engines with items such as ice, drinking water, tools, sanitary supplies, stationery or flagging equipment.
- “Testing” does not include an employee making visual observations while on or alongside a locomotive.

**Group of Workmen.** Two or more workmen of the same or different crafts, who work as a unit under a common authority and communicate with each other while working.

**Rolling Equipment.** Engines, cars and one or more engines coupled to one or more cars.

**Blue Signal.** During the day, a clearly distinguishable blue flag or light, and at night, a blue light. The blue light may be steady or flashing.

The blue signal does not need to be lighted when it is attached to the operating controls of an engine and the inside of the engine cab area is lighted enough to make the blue signal clearly distinguishable.

**Effective Locking Device.** When used in relation to a manually operated switch or a derail, a lock that can be locked or unlocked only by the craft or group of workmen applying the lock.

**Car Shop Repair Area.** One or more tracks within an area where rolling equipment testing, servicing, repairing, inspecting or rebuilding is controlled exclusively by mechanical department personnel.

**Engine Servicing Area.** One or more tracks within an area where engine testing, servicing, repairing, inspecting or rebuilding is controlled exclusively by mechanical department personnel.

**Switch Providing Direct Access.** A switch that if used by rolling equipment could permit the rolling equipment to couple to the equipment being protected.

#### **A. What a Blue Signal Signifies**

A blue signal signifies that workmen are on, under or between rolling equipment and requires that:

1. Rolling equipment must not be coupled to or moved, except as provided in “**Movement in Engine Servicing Area**” and “**Movement in Car Shop Repair Area**” of this rule.
2. Rolling equipment must not pass a blue signal on a track protected by the signal.
3. Other rolling equipment must not be placed on the same track so as to block or reduce the view of the blue signal. However, rolling equipment may be placed on the same track when it is placed on designated engine servicing area tracks or car shop repair area tracks, or when a derail divides a track into separate working areas.
4. Rolling equipment must not enter a track when a blue signal is displayed at the entrance to the track.
5. Controls or devices on rolling equipment that could affect equipment movement (for example, MU cables/hoses, hand brakes, angle cocks, etc.) must not be changed or operated unless directed by individuals who placed the blue signals or by the employee in charge of workmen.

Blue signals must be displayed for each craft or group of workmen who will work on, under or between rolling equipment.

**Protection Removed.** Blue signals may be removed only by the craft or group who placed them. Remote control display may be discontinued when directed by the craft or group that requested the protection. When blue signal protection has been removed from one entrance of a double-ended track or from either end of rolling equipment on a main track, that track is no longer under blue signal protection.

## **B. How to Provide Protection**

When workmen are on, under or between rolling equipment and exposed to potential injury, protection must be provided as follows:

**On a Main Track.** A blue signal must be displayed at each end of the rolling equipment.

**On Other than a Main Track.** One of these three methods of protection or a combination of these methods must be provided:

1. Each manually operated switch that provides direct access must be lined against movement onto the track and secured by an effective locking device. A blue signal must be placed at or near each such switch. In addition, any facing point crossover switch must be lined against movement and secured by an effective locking device.
2. A derail capable of restricting access to the track where work will occur must be locked in derailing position with an effective locking device and positioned at least:
  - a. 150 feet from the rolling equipment to be protected.
  - or
  - b. 50 feet from the end of rolling equipment on a designated engine servicing track or car shop repair track where speed is limited to not more than 5 mph.
3. Where remote control switches provide direct access, the employee in charge of the workmen must tell the switch operator what work will be done. The switch operator must then:
  - a. Inform the employee in charge of the workmen that the switches have been lined against movement onto the track and devices controlling the switches have been secured.
  - b. Not remove the locking devices unless the employee in charge of the workmen says it is safe to do so.

- c. Maintain for 15 days a written record of each notification that includes:
  - Name and craft of the employee in charge of the workmen requesting protection.
  - Identification of track involved.
  - Date and time the employee in charge of workmen notified that protection was provided.
  - Date, time, name and craft of the employee in charge of workmen who authorized removal of the protection.

### **C. Blue Signal Readily Visible to Engineer**

In addition to providing protection as required in **“On a Main Track”** and **“On Other than a Main Track,”** when workmen are on, under or between an engine or rolling equipment coupled to an engine:

1. A blue signal must be attached to the controlling engine.
2. A blue signal must be visible to the engineer or employee controlling the engine.
3. The engine must not be moved.
4. Engine controls, brakes, circuit breakers and electrical switches (except cab lights) must not be operated unless directed by individuals who placed the blue signals or by the employee in charge of workmen.

### **D. Reserved**

### **E. Protection for Emergency Repair Work**

If a blue signal is not available for employees performing emergency repairs on, under or between an engine or rolling equipment coupled to an engine, the employee controlling the engine must be notified and appropriate measure taken to provide protection for the employees.

### **F. Movement in Engine Servicing Areas**

An engine must not enter a designated engine servicing area until the blue signal protection is removed from the entrance. The engine must stop short of coupling to another engine.

An engine must not leave a designated engine servicing area unless the blue signal is removed from the engine and the track in the direction of movement.

Blue signal protection removed to let engines enter or leave the engine servicing area must be restored immediately after the engine enters or clears the area.

An engine protected by blue signals may be removed on a designated engine servicing area track when:

1. An authorized employee operates the engine under the direction of the employee in charge of workmen.
2. The blue signal has been removed from the controlling engine to be repositioned.
3. Workmen have been warned of the movement.

#### **G. Movement in Car Shop Repair Area**

When rolling equipment on car shop repair tracks is protected by blue signals, a car mover may reposition the equipment if:

1. Workmen have been warned of the movement.
2. An authorized employee operates the car mover under the direction of the employee in charge of workmen.

### **5.14 Signs Protecting Equipment**

**STOP – TANK CAR CONNECTED**

**SERVICE CONNECTIONS**

When a sign reading:

**EMPLOYEES WORKING**

**STOP – MEN WORKING**

Or a similar warning is displayed on a track or car, the car must not be coupled to or moved. Other equipment must not be placed on the same track in a manner that would block or reduce the view of the sign.

### **5.15 *Improperly Displayed Signals***

If a signal is improperly displayed, or a signal, flag or sign is absent from the place it is usually shown, regard the signal as showing the most restrictive indication it can give.

Promptly report improperly displayed signals or absent fixed signals, flags or signs to the proper authority.

### **5.16 *Observe and Call Signals***

Crew members in the engine control compartment must be alert for signals. As soon as signals become visible or audible, crew members must communicate clearly to each other the name or aspect of signals affecting their train. They must continue to observe signals and announce any change of aspect until the train passes the signal.

If the signal is not complied with promptly, other crew members must remind the engineer and/or conductor of the rule requirement. If the crew members receive no response, or if the engineer is unable to respond, they must immediately take action to ensure safety, using the emergency brake valve to stop the train, if necessary.

## **6 MOVEMENT OF TRAINS AND ENGINES**

### **6.1 *Repeat Instructions***

An employee who verbally receives instructions or information about train or engine movements must repeat them.

### **6.2 *Initiating Movement***

Before initiating movement, a crew member must determine from their supervisor or yardmaster if any work limits are in effect.

### **6.3 *Main Track Authorization***

Do not occupy a main track of a foreign line railroad without the required authority.

### **6.4 *Manual Interlockings***

At a signal displaying a Stop indication, if no conflicting movement is evident, the train will be governed as follows:

- A crew member must immediately contact the control operator.

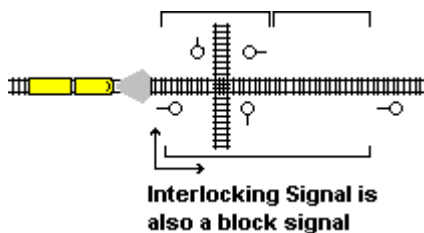


- Before authorizing the train to proceed, the control operator must know that the route is properly lined and no conflicting movement is occupying or authorized to enter the track between that signal and the next absolute signal governing movement or the end of interlocking limits where applicable.
- The control operator may authorize the train to proceed by using hand signals or the following instructions, "After stopping, (train) at (location) has authority to pass signal displaying Stop indication," specifying the route where applicable. The train must move at restricted speed.
- If the signal governs movement over a drawbridge, a crew member must verify that the bridge is in the proper position for the train to pass.

Before proceeding into or continuing in CTC territory, the manual interlocking control operator must be sure that the CTC control operator has given authority to proceed.

## ***Exception***

**Conflicting Movement.** When the control operator has stopped a conflicting movement, he may then authorize another train to proceed, advising both crews of movements to be made. If the stopped movement is later permitted to proceed, that train must move at restricted speed until its leading wheels have passed the next governing signal or the end of the block system.



If a train overruns any block signal that requires it to stop, the crew must:

Warn other trains at once by radio. Stop the train immediately. Report it to the train dispatcher.

## ***6.5 Shoving Movements***

Equipment must not be shoved until the engineer and the crew member protecting the movement have completed a job safety briefing concerning how protection will be provided. When cars or engines are shoved and conditions require, the crew member protecting the movement must take an easily seen position on the leading car or engine, or be ahead of the movement, provide visual protection of the equipment being shoved and must not engage in unrelated tasks while providing protection.

Equipment must not be shoved until it is visually determined that:

- Portion of the track to be used is clear of equipment or conflicting movements.
- The track will remain clear to the location where the movement will be stopped.
- Switches and derails are properly lined.

Crew members assigned to protect shoving movements must be in a position to control the movement and must maintain constant communication with the locomotive engineer making the movement. The locomotive engineer must only take direction from the person controlling the movement and must STOP when no communication is received beyond one-half the distance last specified.

Under no circumstances are crew members relieved from providing visual protection when making a shoving movement. Cars or engines must not be shoved to block other tracks until it is safe to do so. Shoving movements made over road crossings must be made in accordance with Rule 6.32.1 (Providing Warning Over Road Crossings).

**Movement MUST STOP within one-half the distance last specified unless additional instructions are received.....PERIOD!!**

**Application:**

When not using hand signals, radio job briefing must include the following:

- Who will protect the shove?
- Which track is to be shoved?
- How the shove will be protected.
- Distance and direction to be shoved.
- Position of switches and derails, if applicable.

**6.6 Reserved**

**6.7 Reserved**

**6.8 Reserved**

**6.9 Reserved**

**6.10 Calling Attention to Restrictions**

The conductor must remind the engineer that the train is approaching an area restricted by Work Limits.

If the engineer fails to comply with the restriction, the conductor must stop the train.

## **6.11 Reserved**

## **6.12 FRA Excepted Track**

On a track designated as “FRA Excepted Track,” the following will govern:

- Maximum speed must not exceed 10 mph.
- No occupied passenger train will be operated.
- No movement will be operated that contains more than five cars placarded in accordance with the Hazardous Material Regulations.

## **6.13 Yard Limits**

Within Yard Limits, trains or engines are authorized to use the main track not protecting against other trains or engines. Engines must give way as soon as possible to trains as the approach.

All movements entering or moving within yard limits must be made at restricted speed.

Yard Limits remain in effect continuously unless otherwise specified by special instructions or track bulletin.

### **Against the Current of Traffic**

Movements against the current of traffic must not be made unless authorized or protected by yardmasters or other authorized employee.

## **6.14 Work Limits**

**Work Limits:** The Work Limit form authorizes a person in charge of a roadway work group to have exclusive right to occupy, and make inaccessible, a track or tracks within defined limits. No train, engine or other on-track equipment can enter or occupy the specified limits of the Work Limit form.

A red flag or flashing red light placed in the center of the specified track or tracks, at the clearing point, identifies the working limits. When specified on the Work Limit form, a flagman will restrict or direct access into the defined working limits.

1. Track(s) specified on the Work Limit form must not be used without permission of the person in charge named on the Work Limit form.

2. When authorized, only one train or engine can occupy the specified limits of the work limit with the roadway work group. The train or engine occupying the same working limits can only move under the direct authority of the named person in charge of the roadway work group.

When a watchman/lookout is specified by the Work Limit form, this does not relieve the crew of a train or engine, or the operator of other on-track equipment, from requesting permission of the person in charge of the roadway work group to enter, occupy or move through the specified working limits.

Employees affected by the restriction of a Work Limit form or Statement of On-Track Safety for a Lone Roadway Worker form, must have in their possession, a copy of the applicable form received at the beginning of, or during, a tour of duty on the date specified on the form.

### **6.15 Reserved**

### **6.16 Reserved**

### **6.17 Reserved**

## **6.18 Stopping Clear of Crossings and Junctions**

At a railroad crossing or junction, a train or engine must not stop, if possible, where it could interfere with train movement on the other track.

### **6.19 Reserved**

### **6.20 Reserved**

## **6.21 Precaution Against Unusual Conditions**

Protect trains and engines against any known condition that may interfere with their safety.

When conditions restrict visibility, regulate speed to ensure that crew members can observe and comply with signal indications.

In unusually heavy rain, storm or high water, trains and engines must approach bridges, culverts and other potentially hazardous points prepared to stop. If they cannot proceed safely, they must stop until it is safe to resume movement.

Advise the proper authority of such conditions by the first available means of communication.

### **6.21.1 Protection Against Defects**

If any defect or condition that might cause an accident is discovered on tracks, bridges or culverts, or if any crew member believes that the train or engine has passed over a dangerous defect, the crew member must immediately notify the proper authority and provide protection if necessary.

### **6.21.2 Water Above Rail**

Do not operate trains and engines over tracks submerged in water until the track has been inspected and verified as safe.

Operate engines at 5 mph or less when water is above the top of the rail. If water is more than 3 inches above the top of the rail, a mechanical department supervisor must authorize the movement.

## ***6.22 Maintaining Control of Train or Engine***

Crew members must consider train or engine speed, grade conditions and air gauge indications to determine that the train or engine is being handled safely and is under control. If necessary, take immediate action to bring the train or engine under control.

## ***6.23 Emergency Stop or Severe Slack Action***

### **Inspection**

Prior to any additional movement, an inspection of the entire train must be made.

## ***6.24 Reserved***

## ***6.25 Reserved***

## ***6.26 Reserved***

## ***6.27 Movement at Restricted Speed***

When a train or engine is required to move at restricted speed, movement must be made at a speed that allows stopping within half the range of vision short of:

- Train.
- Engine.
- Railroad car.

- Men or equipment fouling the track.
- Stop signal.

or

- Derail or switch lined improperly.

The crew must keep a lookout for broken rail and not exceed 20 mph.

Comply with these requirements until the leading wheels reach a point where movement at restricted speed is no longer required.

## ***6.28 Movement on Other Than Main Track***

Except when moving on a main track, trains or engines must move at a speed that allows them to stop within half the range of vision short of:

- Train.
- Engine.
- Railroad car.
- Men or equipment fouling the track.
- Stop signal.

or

- Derail or switch lined improperly.

Train must move at restricted speed and not exceed the maximum authorized speed for those tracks.

## ***6.29 Reserved***

## ***6.30 Reserved***

## ***6.31 Maximum Authorized Speed***

Crew members are jointly responsible for knowing and not exceeding the maximum authorized speed for their train.

When possible, crew members must notify the proper authority promptly of any condition that will delay or prevent their train from making the usual speed.

## **6.32 Road Crossings**

### **6.32.1 Providing Warning Over Road Crossings**

When cars are shoved over road crossings at grade, a crew member must be on the ground at the edge of the crossing to warn traffic until the

crossing is occupied. Make any movement over the crossing only on the crew member's signal.

Such warning is not required when crossing is equipped with:

- Crossing gates that are in the fully lowered position.  
or
- Flashing lights or passive warning devices when it is clearly seen that no traffic is approaching or stopped at the crossing. Shoving movements must not exceed 10 mph over crossing

### **6.32.2 Automatic Crossing Devices**

**Employees must observe all automatic warning devices and report any that are malfunctioning to the proper authority by the first available means of communication. Notify all affected trains as soon as possible.**

Under any of the following conditions, a movement must not foul a crossing equipped with automatic warning devices until the device has been operating long enough to provide warning and the crossing gates, if equipped, are fully lowered:

When a train has been notified that automatic warning, devices are not operating properly, the train must not occupy the crossing until vehicular traffic is clear of the crossing.

### **6.32.3 Providing Warning for Adjacent Tracks**

When practical, position an employee on the ground to warn traffic against movements approaching on adjacent tracks.

### **6.32.4 Clear of Crossings and Signal Circuits**

Leave cars, engines or equipment clear of road crossings and crossing signal circuits.

If possible, avoid leaving cars, engines or equipment standing closer than 250 feet from the road crossing when there is an adjacent track.

#### **6.32.5 Actuating Automatic Crossing Signals Unnecessarily**

Avoid actuating automatic crossing signals unnecessarily by leaving switches open or permitting equipment to stand within the controlling circuit. If this cannot be avoided and if the signals are equipped for manual operation, a crew member must manually operate the signal for movement of traffic. A crew member must restore signals to automatic operation before a train or engine occupies the crossing or before it leaves the crossing.

#### **6.32.6 Blocking Public Crossings**

A standing train must not block a public crossing longer than 10 minutes. While switching over public crossings, use discretion to avoid delaying highway traffic or causing congestion at highway intersections adjacent to railroad.

## **7 SWITCHING**

### ***7.1 Switching Safely and Efficiently***

While switching, employees must work safely and efficiently and avoid damage to contents of cars, equipment, structures, or other property.

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

### ***7.2 Communication Between Crews Switching***

To avoid injury or damage where engines may be working at both ends of a track or tracks, crews switching must job brief prior to any moves being made and have a clear understanding of movement to be made. When possible, crews should be on the same radio channel.



### **7.3 Additional Switching Precautions**

The following equipment must not be unnecessarily switched, or couplings made so as to damage the equipment or load:

- Intermodal or TOFC cars.
- Multi-level loads.
- Open top loads subject to shifting.

The following equipment must not be cut off in motion or struck by any car moving under its own momentum:

- High-value loads.
- Engines.
- Loaded depressed-center flat cars.
- Cars loaded with modular housing units.

### **7.4 Precautions for Coupling or Moving Cars or Engines**

Before coupling to or moving cars or engines, verify that the cars or engines are properly secured and can be coupled and moved safely.

Make couplings at a speed of not more than 4 mph. Stretch the slack to ensure that all couplings are made.

### **7.5 Testing Hand Brakes**

Employees must know how to operate the type of hand brakes they are using. When hand brakes must control or prevent car movement, test the brakes to ensure that they are operating properly before using them.

### **7.6 Securing Cars or Engines**

Do not depend on air brakes to hold a train, engine or cars in place when left standing. A sufficient number of hand brakes must be applied to prevent movement, with a minimum of two brakes on cuts of multiple cars. Cuts in excess of two cars should have a sufficient number of additional brakes applied to secure the cut. Single cars may be secured with one hand brake. If hand brakes are not adequate, block the wheels.

Locomotives must be secured with a hand brake applied on each individual unit, regardless of whether coupled to one or more additional units.

When the engine is coupled to a train or cars standing on a grade, do not release the hand brakes until the air brake system is fully charged.

When cars are moved from any track, apply enough hand brakes to prevent any remaining cars from moving.

### **7.6.1 Single Car Securement**

- A.** Do not detach and leave a single car standing when the car can be coupled to and left secured with other equipment.

After performing a single car securement test as required below, a single car may only be left standing when:

- On a customer's industry track or within a customer's facility.
- In a yard equipped with derail protection.
- An articulated car is equipped with two hand brakes and both hand brakes are applied and functioning.
- The Car Department has chained the car to the rail.

- B.** When a single car will be left standing, perform the following steps in the order outlined to prevent uncontrolled movement.

- Apply all hand brakes on car to be set out.
- Move car a sufficient distance to ensure hand brake(s) are functioning properly (If brake system is charged, release air brake on car before moving.)
- Slowly bunch or stretch the slack at the coupler where uncoupling is to be made.
- Observe and verify car does not move for 1 minute. If movement is observed, set out an additional car and retest.

## **7.7 Reserved**

## **7.8 Coupling or Moving Cars on Tracks Where Cars Are Being Loaded or Unloaded**

Before coupling to or moving cars on tracks where cars are being loaded or unloaded, crew members must be sure that all of the following have been removed or cleared:

- Persons in, on or about cars.
- Platforms.

- Boards.
- Tank car couplings and connections.
- Conveyors.
- Loading or unloading spouts and similar appliances or connections.
- Vehicles.
- Other obstructions.

In addition:

- Be careful to avoid damage to freight of partly loaded cars.
- Do not handle cars that are improperly or unevenly loaded if load could shift or fall from the car, or if the car could derail or overturn.
- Return any car placed for loading or unloading to the location it was found if it has not been released for movement.
- Do not pull empty cars from an unloading facility until any major accumulation of debris is removed.
- Ensure that plug-type and swinging doors on cars are properly closed and secured. However, crew members must not attempt to close those doors. If plug door is found open enroute, car may continue in the train to the next location where mechanical forces are available to close door. Plug door cars must not be moved with doors open.

## **7.9 Reserved**

## **7.10 Movement Through Gates or Doorways**

Before moving engines, cars or other equipment through gates, doorways, or similar openings, stop to ensure that the gates, doorways, or openings are completely open and secure. When overhead or side clearances are close, make sure movement is safe. Do not ride on side of a car, engine, or other equipment when moving through gates, doorways, similar openings or on side of equipment moving adjacent to close clearances.

## **7.11 Charging Necessary Air Brakes**

Do not handle cars without charging the air brake system unless the cars can be handled safely and stopped within the required distance. If necessary, couple the air hose and charge the brake systems on a sufficient number of cars to control movement.

## **7.12 Movement into Spur (or Stub) Tracks**

When shoving cars into a spur (or stub) track, control movement to prevent damage at the end of the track, and do the following:

- Stop movement 150 feet from the end of the track and conduct a job briefing.
- Apply hand brakes, when necessary, to control slack.
- Have a crew member precede any further movement when it can be done safely.
- Move only on the crew member's signal.

## **7.13 Reserved**

## **7.14 Verification of Intended Route**

Locomotive engineers must be especially watchful when moving into areas of restricted visibility. To accomplish this, the locomotive engineer, as well as other crew members in the cab of the locomotive, **must be facing in the direction of movement**. If no crew member is positioned to see the required distance for movement, the locomotive engineer must STOP the movement and place himself (or herself) in a position to verify that the intended route for the movement is clear and that all switches are properly lined for that movement. The locomotive engineer must not use the rear-view mirror to verify the route is clear.

## **7.15 Reserved**

# **8 SWITCHES**

## **8.1 Hand Operation of Switches**

All switches operated by hand are considered hand-operated switches, and all rules governing hand-operated switches apply to them.

## **8.2 *Position of Switches***

The employee operating a switch or fixed derail is responsible for the position of the switch or fixed derail in use. Movement must not foul an adjacent track until the hand-operated switch or derail is properly lined.

Do not operate a switch that is tagged. If the switch is spiked, do not remove the spike unless authorized by the same craft or group that placed it.

Employees operating switches and derails must make sure:

- The switches and derails are properly lined for the intended route.
- The points fit properly and the target, if so equipped, corresponds with the switch's position.
- When the operating lever is equipped with a latch, they do not step on the latch to release the lever except when operating the switch.
- After locking a switch or derail, they test the lock to ensure it is secured.
- The switch is not operated while equipment is fouling, standing on or moving over the switch.
- When equipment has entered a track, the switch to that track is not lined away until the equipment has passed the clearance point of the track.

When possible, crew members on the engine must see that the switches and derails near the engine are properly lined.

## **8.3 *Reserved***

## **8.4 *Reserved***

## **8.5 *Reserved***

## **8.6 *Reserved***

## **8.7 *Reserved***

## **8.8 *Switches Equipped with Locks, Hooks, or Latches***

When not in use, switches must be locked, hooked or latched if so equipped. Before making movements in either direction over these switches, make sure the switch is latched or secured by placing the lock or hook in the hasp. However, when making train movements in facing point direction, lock the switches equipped with a lock.

Replace any missing or defective switch locks. If they cannot be replaced, report the condition at once to the supervisor in charge.

## **8.9 Reserved**

## **8.10 Reserved**

## **8.11 Reserved**

## **8.12 Hand-Operated Crossover Switches**

Both switches of a crossover shall be properly lined before equipment begins a crossover movement. A crossover movement shall be completed before either switch is restored to normal position, except when one crew is using both tracks connected by the crossover during continuous switching operations.

Crossover switches may be left out of correspondence when providing Blue Signal or Inaccessible Track protection. When protection is no longer required, the crossovers must be returned to a corresponding position.

## **8.13 Scale Track Switches**

When scales are not in use, line switches for dead rails where provided.

## **8.14 Conflicting Movements Approaching Switch**

When conflicting movement is closely approaching a switch, the track must not be fouled or the switch operated. Trains must not pass beyond the clearance point until the switch connected with the movement is properly lined.

Crossover switches must not be unlocked or lined for crossover movement when another movement is approaching or passing over either switch.

## **8.15 Switches Run Through**

Do not run through switches. An engine or car that partially runs through a switch must continue movement over the switch. The engine or car must not change direction over a damaged switch until it has been spiked or repaired. Report any and all run through switches immediately to the appropriate supervisor.

## **8.16 Damaged or Defective Switches**

Report a switch that is damaged or defective to the supervisor in charge. Tag the switch, spike it if necessary, unless a trackman or other competent employee takes charge. If the switch cannot be made safe, provide protection at once.

## **8.17 Avoid Sanding Over Movable Parts**

When possible, avoid using sand over movable parts of an interlocking plant or variable switches.

## **8.18 Reserved**

## **8.19 Reserved**

## **8.20 Derail Location and Position**

Employees in train, engine and yard service must know the location of all fixed derails. A train or engine moving on or entering tracks where fixed derails are located must stop at least 100 feet from the derail in derailing position. Movement must not continue until the derail is placed in the non-derailing position. Once movement is complete, derail must be returned to derailing position. However, the distance restriction will not apply in engine servicing areas.

Do not make a movement over a derail in derailing position.

Sidings having hand-thrown derails will have derail locked in the derailing position, except when engines or cars are left unattended on siding. On auxiliary tracks other than siding, except when derails are placed in non-derailing position to permit movement, make sure they are always in derailing position regardless of whether cars are on the track they are protecting. Lock all derails equipped with a lock.

The employee providing protection is responsible for a visual inspection of the derail and for verifying the derail is in the non-derailing position prior to making a movement past the derail.

Conductors, Brakemen and Engineers are required to discuss the location of all derails that will be encountered at the beginning of their shift during the initial job briefing. In addition, a secondary job briefing is required prior entering any track equipped with a derail.

## GLOSSARY

**ABS** - See Automatic Block Signal System.

**Absolute Signal** - An interlocking signal without a number plate, or designated by an A marker.

**Articulated** - Permanently connected multiple unit cars that share a common truck.

**Automatic Block Signal System (ABS)** - A series of consecutive blocks governed by block signals. The signals are activated by a train or by certain conditions that affect the block use.

**Block** - A length of track between consecutive block signals, or between a block signal and the end of the block system limits.

**Block Register Territory** - A method of operation in non-signaled territory where trains, men and equipment are authorized to occupy the main track in limits designated by the timetable.

**Block Signal** - A fixed signal at the entrance of a block that governs trains entering and using that block.

**Block System** - A block or series of blocks within interlocking limits.

**Cars** - Railroad cars.

**Clearance Point** - The location closest to a switch where it is safe for equipment, and a person riding the side of equipment unless prohibited, to pass equipment on an adjacent track.

**Conductor** - The employee in charge of train or yard movements.

**Control Operator** - The employee assigned to operate an interlocking control machine.

**Control Point** - The location of absolute signals controlled by the control operator.

**Controlled Signal** - An absolute signal controlled by the control operator.

**Crew Member** - Conductors, engineers, brakemen and switchmen.

**Crossings at Grade** - Crossings that intersect at the same level.

**Crossover** - A track connection between two adjacent tracks, consisting of two switches, which is intended to be used primarily for the purpose of crossing over from one track to the other.



**Current of Traffic** - The movement of trains in one direction on a main track, as specified by the rules.

**Distant Signal** - A fixed signal outside a block system that governs the approach to a block signal or interlocking signal. A distant signal does not indicate conditions that affect track use between the distant signal and block or interlocking signals. A distant signal is identified by a D.

**Double Track** - Two main tracks where the current of traffic on one track is in a specified direction and the opposite direction on the other.

**Engine** - A unit propelled by any form of energy or more than one of these units operated from a single control. Engines are used in train or yard service.

**Engineer** - Employee in charge of operating one or more engines in train or yard service.

**Equipment** - Railroad equipment.

**Equipment Fouling a Track** - The end of rolling equipment or on-track maintenance of way equipment left between the clearance point and the switch points leading to the track on which the equipment is standing.

**Fixed Signal** - A signal that is fixed to a location permanently and that indicates a condition affecting train movement.

**Flagman** - Any employee providing flag protection.

**Foreman** - An employee in charge of work.

**Interlocking** - Signal appliances that are interconnected so that each of their movements follow the other in a proper sequence. Interlockings may be operated manually or automatically.

**Interlocking Limits** - The tracks between outer opposing absolute signals of an interlocking.

**Interlocking Signals** - The fixed signals of an interlocking that govern trains using the interlocking limits.

**Main Track** - A track extending through yards and between stations that must not be occupied without authority or protection.

**Men** - Railroad employees.

**Pilot** - An employee assigned to a train to assist an engineer or conductor who is unfamiliar with the rules or the portion of railroad the train will operate over.

**Proceed Indication** - Any block signal indication that allows a train to proceed without stopping.

**Reverse Movement** - A movement opposite from the authorized direction.

**Siding** - A track connected to the main track and used for meeting or passing trains.

**Signal Aspect** - The appearance of a fixed signal.

**Signal Indication** - The action required by the signal aspect.

**Single Track** - A main track where trains are operated in both directions.

**Special Instructions** - Documents containing information specific to a work location and posted at that work location.

**Train** - One or more engines coupled, with or without cars, displaying a marker and authorized to operate on a main track. A term that when used in connection with speed restrictions, flag protection and the observance of all signals and signal rules also applies to engines.

**Trainmen** - Conductors, assistant conductors, brakemen, yard engine foremen, switchmen and yard helpers.

**Variable Switch** - A switch that when trailed through, the switch points remain lined in the position they were forced.

**Work Limit** - A segment of track, or tracks, within definite limits established in accordance with the rules over which trains, engines or other on-track equipment may move only as authorized by the roadway worker having control over the track(s) within the working limits.

**Yard** - A system of tracks, other than main tracks and sidings, used for making up trains, storing cars and other purposes.

**Yard Limits** - A portion of main track designated by yard limit signs or special instructions.



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## **30 AIR BRAKE TESTS AND INSPECTIONS**

### **30.1 General Requirements**

#### **30.1.1 Compliance with FRA Regulations**

Air brake equipment on locomotives and cars must be inspected and tested according to Federal Railroad Administration (FRA) regulations. Those regulations are contained within these rules. The following requirements for inspecting and testing air brake equipment will help engine and train crew members move their trains safely and efficiently.

Inspections and air brake tests must be performed by a “Qualified Person,” “Qualified Mechanical Inspector” or a “Qualified Maintenance Person” as specified by Federal Regulations.

#### **30.1.2 Responsibility for Required Air Test**

Supervisors and inspectors are jointly responsible with the engineer and trainmen for the condition of air brake equipment on locomotives and cars to the extent that it is possible to detect defective equipment by required air tests.

The employee performing the air brake test is in charge while the test is being conducted and must ensure that all other employees are safely positioned before beginning the test. The employee in control of the air brakes must not apply or release brakes without permission from the employee performing the air brake test.

At locations where a freight car is placed in a train and car inspection forces are not immediately available to inspect the freight car, crew members must inspect the car for the following defect conditions:

1. Car body that:
  - Is leaning or listing to the side.
  - Is sagging downward.
  - Is improperly positioned on the truck.
  - Has an object dragging below or extending from the side.
  - Has an insecurely attached door.

or

- Has contents leaking from a placarded hazardous material car.
2. Defective or insecure coupling.
  3. Overheated wheel or journal.
  4. Broken or cracked wheel.
  5. Brake that fails to release.

or

6. Other apparent safety hazards that could cause an accident before the train arrives at its destination.

When a defect is found, a crew member must write the defect on a tag and attach the tag near the defect. A crew member must relay this information to the proper authority as soon as possible.

### **30.1.3 Coupling and Securing Air Hoses**

Before coupling air hoses between locomotives and/or cars, employees must:

- Shake debris out of the hoses.
- Blow all condensation from the locomotive brake pipe or yard airline.

Whenever possible, secure air hoses on locomotives and cars during all movements to prevent the hoses and glad hands from dragging and becoming damaged.

### **30.1.4 Piston Travel**

Follow these piston travel requirements:

#### **Truck-Mounted Brake Cylinders**

- Piston travel must provide brake shoe clearance when brakes are released.
- Piston travel must not exceed 4 inches where the piston acts directly on the brake beam.

### **Body-Mounted Brake Cylinders**

- At the initial terminal:
  - If the piston travel of brake cylinders with a 12 – inch capacity is less than 7 inches or more than 9 inches, the piston travel must be adjusted to approximately 7 inches.
  - or
  - The piston travel of other brake cylinders on freight cars must be adjusted according to the specifications on the badge plate or stenciling on the car.
- At other locations, the air brakes are not considered in effective operating condition when piston travel is within 1-1/2 inches of cylinder capacity.

### **30.1.5 Testing Air Brakes During Cold Weather**

When the outside temperature is 15 degrees F or colder, or when specified by the proper authority, air brake tests required by Rule 30.2.2 (Procedure for Inspection and Test) may be conducted using the leakage test method or air flow method as follows:

#### **Leakage Test Method**

When using the leakage test method:

- Conduct the test from a pipe pressure of 75 PSI.
- Reduce the regulating valve setting to 75 PSI before starting the test.
- Increase the regulating valve to the standard setting immediately after completing the test successfully.
- After increasing the regulating valve to the standard setting, wait 15 minutes before proceeding.

#### **Air Flow Method**

When using the airflow method, make sure the regulating valves are at the standard setting of 90 PSI. The airflow method does not change during cold weather.

## **30.2 Initial Terminal (Class 1) Air Brake Tests**

### **30.2.1 Location of Test**

A qualified employee must inspect and test all trains as specified in Rule **30.2.2** (Procedure for Inspection and Test) at the following locations:

- A. Where the train is originally made up (initial terminal).
- B. Where the train consist (including train received in interchange) is changed by other than one or more of the following:
  - Adding one solid block.
  - Removing one solid block from the head end or rear end of the train.
  - Removing defective cars.
  - Repositioning cars to meet hazardous material or restricted car placement requirements.or
  - Changing locomotive consist.
- C. Where any portion of the train has been off air for more than 4 hours.

### **30.2.2 Procedure for Inspection and Test**

Determine which test method will be used. If the controlling locomotive is equipped with a calibrated airflow indicator gauge, the airflow method will be used. The leakage test method is an alternative. After the test begins, the train must be qualified using the method initially used.

Before conducting the airflow method or leakage test method, charge the air brake system to within 15 pounds of the locomotive regulating valve setting, as indicated by the gauge or device connected to the brake pipe at the rear of the train. The regulating valve must be set at 90-psi.

During the air test, do not apply or release brakes unless notification is received. Do not actuate the independent brake valve during the air test.



## **A. Air Flow Method**

1. *Before the test can begin:*
  - a. Make sure the airflow indicator (AFI) gauge is calibrated. On TGS locomotives, this is shown with a 1/4-inch red dot on the gauge face.
  - b. Make sure the AFI reading is at or below 60 CFM. If the reading exceeds 60 CFM, refer to Rule 30.2.3 (Leakage Requirements).
2. *Apply Brakes.* When proper notification has been received to apply the brakes for the test, do the following:
  - a. Make a 20-pound brake pipe reduction.
  - b. After the brake pipe air has stopped exhausting at the automatic brake valve, notify the inspector that the brakes are applied for the test.
3. *Inspection of Brake Application.* Inspect the brake application to determine that:
  - Angle cocks are properly positioned.
  - Brakes are applied on each car.
  - Piston travel is correct.
  - Brake rigging does not bind or foul.
  - All parts of the brake equipment are properly secured.
4. *Test and Inspection Complete.* When the test and inspection of the air brake application is complete and the proper notification has been received to release the brakes:
  - a. Place the automatic brake valve handle in the RELEASE position.
  - b. Notify the inspector that the brakes have been released.
  - c. Inspect each brake to make sure all brakes have released. This inspection may occur as the train departs. However,

make sure the AFI reading is at or below 60 CFM before the train departs.

5. *One Hundred Percent Operative Brakes.* Make sure 100 percent of the train brakes are operative before departing.

## **B. Leakage Test Method**

1. *Application of brakes.* When proper notification has been received to apply brakes for the test, do the following:
  - a. Make a 20-pound brake pipe reduction.
  - b. Wait 1 minute after the brake pipe air has stopped exhausting at the automatic brake valve.
  - c. Cut out the pressure-maintaining feature by placing the brake valve cutoff valve in the OUT position.
  - d. Wait 1 minute for the brake pipe pressure to equalize.
  - e. Test the brake pipe leakage for 1 minute and make sure it does not exceed 5 pounds per minute. If leakage exceeds 5 pounds per minute, refer to Rule 30.2.3 (Leakage Requirements).
  - f. Notify the inspector that the brakes are applied for the test.
2. *Inspection of Brake Application.* Inspect the brake application to determine that:
  - Angle cocks are properly positioned.
  - Brakes are applied on each car.
  - Piston travel is correct.
  - Brake rigging does not bind or foul.
  - All parts of the brake equipment are properly secured.
3. *Test and Inspection Complete.* When the test and inspection of the air brake application is complete and the proper notification has been received to release the brakes:

- a. Place the automatic brake valve handle in the RELEASE position.
  - b. Cut in the pressure-maintaining feature by placing the brake valve cutoff valve in the FRT or PASS position, as appropriate.
  - c. Notify the inspector that the brakes have been released.
  - d. Inspect each brake to make sure all brakes have been released. This inspection may occur as the train departs.
4. *One Hundred Percent Operative Brakes.* Make sure 100 percent of the train brakes are operative before departing.

### **C. Engineer Notification**

A qualified person who participated in the test and inspection or who knows the test was completed must notify the engineer either verbally or in writing that the initial terminal (class 1) air brake test has been performed satisfactorily. However, the qualified person must provide the notification in writing if the road crew will report for duty after the qualified person goes off duty.

Engineers receiving written notification of the air brake test must accept the notification as authority that the initial terminal road train air brake test has been performed satisfactorily.

Engineers must leave written notification on the controlling locomotive for the relieving engineer at crew change locations. However, the relieving engineer is not required to have written notification before departing.

### **30.2.3 Leakage Requirements**

If during the leakage test method, the brake pipe gauge indicates leakage that exceeds 5 pounds per minute, or if during the airflow method the airflow indicator reading exceeds 60 CFM, notify the inspector and correct the leakage as follows:

1. Place the automatic brake valve handle in the RELEASE position.
2. Cut in the pressure-maintaining feature when using the leakage test method.
3. Inspect the train for leaks and correct the leakage.

4. When the leakage is corrected, conduct a complete test of the brakes as specified in Rule 30.2.2 (Procedure for Inspection and Test).

### **30.3 Locomotive Consist Air Brake Tests**

#### **30.3.1 Locomotive Brakes in Operative Condition**

When locomotive inspection forces are not immediately available, an engineer taking charge of a locomotive consist must know that the brakes are in operating condition. A locomotive air brake test must be conducted when any of the following takes place:

- Taking charge of a locomotive consist.
- Making up a locomotive consist.
- Adding a locomotive to a consist.
- Other than rear locomotive is removed from a consist.
- Locomotive consist is rearranged.

or

- Changing operating ends.

#### **30.3.2 Locomotive Consist Changes**

When adding, removing, or changing units within a consist:

- Connect hoses between the units.
- Open related cutout cocks.
- Position automatic and independent air brake equipment for lead or trail, as appropriate.
- When the test is performed on a grade, apply sufficient hand brakes and, when necessary, block wheels.

### **30.3.3 Procedure for Inspection and Test of Locomotive Brakes**

An employee must observe the application and release of brakes from the ground during the following procedure:

#### **A. Independent Brakes**

1. With the independent and automatic brake valve handles in the RELEASE position, apply the independent brakes.
2. When the brakes apply on all units, release the independent brakes.

#### **B. Automatic Brakes**

1. When the brakes are released on all units, apply the automatic brakes by making a 10-pound brake pipe reduction.
2. When the brakes apply on all units, return the automatic brake valve handle to the RELEASE position.

#### **C. Actuate Independent Brakes**

1. When the brakes are released on all units, apply automatic brakes by making a 20-pound brake pipe reduction.
2. When the brakes apply on all units, depress the independent brake valve handle (actuate) and make sure the brakes release on all units.
3. Return the brake valve handles to their required positions.

## **30.4 Application and Release Tests**

When the air brake rules require an application and release test on a train, conduct the test as follows:

1. Charge the brake system to the amount specified by the respective rule. If no pressure is specified, charge the brake system until a brake pipe reduction of 20-pounds will apply the brakes on the rear car.
2. When proper notification has been received, apply the train brakes by making a 20-pound brake pipe reduction.
3. Visually determine that the brakes apply on the rear car.

4. When proper notification has been received, release the train brakes by moving the automatic brake valve handle to the RELEASE position.
5. Visually determine that the brakes on the rear car release.

## **30.5 Initial Terminal (Class 1) and Transfer Train Air Brake Tests**

### **30.5.1 Detaching Locomotive or Separating Train**

Complete the following procedures when detaching a locomotive or separating a train or cars being handled with air brakes:

Apply the train brakes with a 20-pound brake pipe reduction. Secure portion of train to remain standing in accordance with Railroad Operating Rule 7.6 (Securing Cars or Engines).

1. Have the engineer notify a crew member when the air has stopped exhausting at the automatic brake valve.
2. Close the angle cock on the locomotive or on the cars that will be detached with the locomotive.
3. Make sure the angle cock on the portion of the train or cars left standing is left open to allow emergency brake application.

### **30.5.2 Re-coupling Locomotive or Cars**

Complete the following procedures when re-coupling the locomotive or cars to the rear of the train and the train consist has not been changed, or as specified by other rules:

1. Verify that the pin has dropped and the coupling has been made before connecting brake pipe hoses and opening angle cocks.
2. If the train consist has not been changed, make sure that crew members:
  - a. On a freight train equipped with a brake pipe gauge or device at the rear of the train know that the brake pipe pressure is being restored before the train departs.or
  - b. On a freight train not equipped with a brake pipe gauge or device on the rear of the train, conduct an application and release test

of the brakes as specified in Rule 30.4 (Application and Release Tests).

### **Train Separated More than 2 Hours:**

After re-coupling cars that have been separated from the locomotive for more than 2 hours, conduct a test and inspection of the brakes on those cars as specified in rule 30.2.2 (Procedure for Inspection and Test).

### **30.5.3 Reserved**

### **30.5.4 Reserved**

### **30.5.5 Making Transfer Train and Yard Train Movements**

Transfer train and yard train movements not previously tested as specified in Rule 30.2.2 (Procedure for Inspection and Test) must be tested as follows:

**A. Movements Not Exceeding 20 Miles.** For movements not exceeding 20 miles:

1. Charge the air brake system to at least 60 PSI.
2. Make a 20 pound brake pipe pressure reduction.
3. Verify that the brakes apply on each car.

**B. Movements Exceeding 20 Miles.** For movements that exceed 20 miles, conduct an inspection and test as specified in Rule 30.2.2 (Procedure for Inspection and Test).

## **30.6 Reserved**

## **30.7 Locomotive Daily Inspection**

### **30.7.1 Sufficient Number of Forms**

To comply with requirements specified in Rule 30.7 (Locomotive Daily Inspection) and Rule 30.8 (Conditions Found Enroute), engineers must keep a supply of:

- Locomotive Daily Inspection Report Forms.
- Inspection Record Cards.

### **30.7.2 When Inspection Is Required**

Each locomotive in service must be inspected daily. Determine whether the locomotive needs to be inspected by checking the Inspection Record Card located in the locomotive cab.

If the record card indicates that the locomotive was inspected the previous day, complete the current day inspection prior to 2359 to allow the locomotive to remain in service

If the record indicates that the locomotive was not inspected the previous day, or there is no record on the locomotive, inspect the locomotive consist before it is placed into service on the current day.

### **30.7.3 Inspection Requirements**

Inspection requirements apply to each unit; however, locomotive consists do not need to be separated for the purpose of performing inspections.

Not all defects are non-complying conditions; however, the following items are non-complying conditions if found to be improper, unless relieved by Note 1 or Note 2.

Inspect the following three general areas of each locomotive to complete the daily inspection.

#### **A. Control Compartment/Locomotive Cab**

Ensure that:

1. Each air gauge registers correctly and within 3 pounds of required pressure.
2. Main reservoir pressure is:
  - a. Low – **120** PSI.
  - b. High – **130** PSI.
3. Brake pipe pressure is:
  - a. Freight trains – **90** PSI.
  - b. Yard engines – **90** PSI.



4. Independent brake cylinder pressure is 30 PSI or greater when the brakes are fully applied. Brakes operate as described in Rule 30.3.3 (Procedure for Inspection & Test of Locomotive Brakes).
5. The following are operational:
  - Headlight: A minimum of one headlight bulb must be operational on each end (See Note 1).
  - Ditch Lights (See Note 2).
  - Horn (See Note 2).
  - Bell (See Note 2).
  - Sanders: deposit sand in front of the lead wheels and behind the rear wheels of each unit in the consist. On the walk-around on the ground, check to see that sand is deposited. If no sand is present, check the sand boxes for sand. If empty, add sand before continuing in service.
  - Gauge lights and engineer's overhead cab light: when a light is burned out, if other lights are sufficient to allow visibility from the crew's normal position, treat it as a defect and not as a non-complying condition (See Note 2).
  - Speed indicator: after a daily inspection (on locomotives operated at speeds above 20 MPH), if the speed indicator failure is identified on the lead unit as soon as the unit begins moving, the failure is considered a defect condition discovered during the daily inspection (See Note 2).
6. Locomotive cab is free of stumbling, slipping or tripping hazards.
7. Windows provide a clear view (small cracks that do not impair vision are acceptable).
8. No traction motors have been cut out.
9. The emergency brake valve is properly labeled, accessible and appears functional.
10. Cab seats are properly secured.

11. On units having an easily accessible event recorder, inspect it for tampering. However, do not open sub-deck doors to inspect event recorders.
12. If operating at a Federal Railroad Administration (FRA) regulated site, ensure that FRA form F6180-49A (blue card) is displayed in cab and has current periodic mechanical department inspection. The most recent periodic inspection of a locomotive must not be more than 92 days old. If so, unit is considered out-of-service and cannot be used.

## **B. Walkway and Engine Compartment**

Inspect both sides of the engine to ensure that:

1. Walkways and walk-in compartments are clear of debris, tools and accumulated oil or grease that present a hazard to the crew.
2. Handrails, handholds, steps, ladders, safety chains and guards are secured and ready for service. Inspect for broken, bent, damaged or loose equipment. Safety chains between units should be connected high enough for safe passage.
3. All electrical and rotating equipment guards are in place.
4. The diesel engine has no active exhaust, water, oil or fuel leaks (treat minor leaks that do not present a safety hazard or environmental problem as a defect and not as non-complying condition).
5. The hand brake is operational.
6. Walkway and engine compartment lights are working (when a light is burned out, if other lights are sufficient to allow visibility, treat it as a defect and not as a non-complying condition).

## **C. Ground Level**

Inspect the exposed areas for apparent defects, but do not crawl under or between units to make the visual inspection.

Set hand brakes, if necessary, and walk around both sides of the engine to ensure that:

1. Sand has been deposited on the rail in front of the lead wheels and behind the rear wheels of each unit.
2. There are no fuel tank leaks or hazardous accumulations of oil on visible areas of the traction motor cables.
3. The following are free from obvious cracks, broken or missing parts:
  - Locomotive trucks, springs, rigging and shock absorbers.
  - Wheels (this includes visually comparing wheels for significant differences in flange wear).
  - Gear cases.
  - Draft gears.
4. Brake cylinder piston travel is adjusted as follows:
  - Minimum – sufficient to provide brake shoe clearance when the brakes are released.
  - Maximum – 1-1/2 inches less than the travel entered on the periodic inspection card.
5. Foundation brake rigging is secured and all components other than wheels and sand hoses are at least 2 ½ inches above the top of the rail.
6. Snowplow, pilot or endplate is properly secured and is between 3 inches and 6 inches above the top of the rail.
7. Brake shoes are secured and approximately in line with the tread of the wheel. Make sure there are no obvious lips or ridges on shoes that overhang the wheel.
8. No part of the electrical cable is lying on the coupler, has exposed bare wires or creates a tripping hazard.
9. Electrical cables not in use are stowed, or the disconnected ends are placed into a dummy receptacle or multi-unit cable holder.
10. Drain oil and water from main reservoirs. If equipped with automatic drains, ensure the valve handles are turned fully clockwise to the automatic position, with the stem extending

beyond the valve handle. If not in the automatic position, place automatic drains in the automatic position or manually drain oil and water from the main reservoirs.

**Note 1:** A minimum of one headlight bulb must be operational on both ends of a single unit, or the lead and trailing ends of a locomotive consist. Ditch lights or other auxiliary external lights must not be substituted for headlights for the purpose of satisfying this requirement. Enter other headlight defects on the Locomotive Daily Inspection Report.

**Note 2:** Units with these defects may be used for power as trailing units. Enter the defects on the Locomotive Daily Inspection Report.

### **30.7.4 Inspection Complete**

#### **A. Locomotive Daily Inspection Report**

Complete a Locomotive Daily Inspection Report for each unit inspected, and:

1. Return the Locomotive Daily Inspection Report to the office upon completion of tour of duty.
2. Immediately report any non-complying conditions to the proper authority.

Non-complying conditions found during the daily inspection must be corrected before the unit is placed in service, unless relieved by Notes 1 or 2.

#### **B. Inspection Record Card**

Complete the Inspection Record Card on each unit inspected.

### **30.7.5 Locomotive Safe to Move**

During the locomotive daily inspection, an employee finding one or more non-complying conditions must determine if the locomotive is safe to move. If unsure whether the locomotive is safe to move, the employee must contact the proper authority.

Unless relieved by Note 1 or Note 2, if a non-complying condition is found and it is determined the locomotive is safe to move, it may be moved only:

- As a single unit under power not attached to cars.
  - In a locomotive consist not attached to cars
- or
- Isolated or shut down when attached to cars.

### **30.7.6 Locomotive Not Safe to Move**

If the employee determines the locomotive is not safe to move, notify the proper authority.

## **30.8 Conditions Found Enroute**

### **30.8.1 Defect or Problem**

If the defect or problem is not a non-complying condition, the engineer must report the defects or problems of all units in the consist on a single Locomotive Daily Inspection Report and return the report to the office upon completion of tour of duty.

The engineer must report any defects or problems to the proper authority.

Some examples of defects or problems include:

- Weather stripping is defective.
- One headlight of the dual set is burned out.
- Ground relay is tripped.
- Safety valve on the air compressor is popping off.

### **30.8.2 Non-Complying Condition**

A locomotive that develops a non-complying condition enroute may continue operating if the engineer or other qualified employee determines the locomotive is safe to move and completes the requirements of Rule 30.7.5 (Locomotive Safe to Move). The locomotive may then be operated until the next daily inspection or until it reaches the nearest point where repairs can be made, whichever occurs first.

The engineer must do the following:

- Report any non-complying conditions on a Locomotive Daily Inspection Report.
- Return the completed Locomotive Daily Inspection Report to the office upon completion of tour of duty.
- Report non-complying conditions to the proper authority as soon as possible.
- Notify the relieving engineer of any non-complying conditions when possible.

For example, if a non-complying condition is found enroute:

Refer to Rule 30.7.3 (Inspection Requirements) for non-complying conditions and include the following:

- While performing a speed indicator check, an employee recognizes that the accuracy of the speed indicator is off by more than 3 MPH plus or minus to 30 MPH.
- While moving, crew members detect flat spots. Inspection determines that one or more flat spots are 2 ½ inches or more in length or that flat spots of 2 inches or more are adjoining.

Units having flat spots that conform to the above description must be set out at the first available point and speed must not exceed ten (10) mph.

## **31 TRAIN OPERATION AND HANDLING RULES**

### **31.1 Locomotives, Cars or Train Standing**

#### **31.1.1 Equipment Unattended**

Do not depend on the air brakes to hold a locomotive, cars, or a train standing unattended.

##### **A. Locomotives Unattended**

Secure locomotives to be left unattended as described in Rule 31.1.2 (Locomotives Unattended).

##### **B. Cars Unattended**

Secure cars to be left unattended as described in Railroad Operating Rule 7.6 (Securing Cars or Engines).

#### **31.1.2 Locomotive Unattended**

Place unattended locomotives on a track protected by a derail, when possible.

The following instructions apply at all locations other than designated locomotive servicing and repair tracks (at designated locomotive servicing and repair areas, secure locomotives as instructed by local supervisors or local instructions, but not less than 1 hand brake).

On the locomotive consist, apply all hand brakes on all units equipped to hold the locomotives. Verify that hand brakes hold the locomotives by releasing automatic and independent air brakes; then reapply the independent brakes after verification. If necessary, place a wooden blocking or other appropriate blocking device under the front and back of one pair of wheels. Make sure the equipment is positioned as follows:

1. Throttle is in IDLE.
2. Reverse lever is in NEUTRAL and the handle is removed.
3. Generator field switch is OFF.
4. Independent brake is cut in and fully applied.

5. On lead unit, place automatic brake valve in RELEASE position; on trailing unit, automatic brake valve in the HANDLE OFF position.
6. Isolation switch is in the ISOLATION position on all units in the consist.
7. Windows are closed and latched.
8. Engines are shut down if required.
9. Electrical cable is properly stowed, or the disconnected end is placed into a dummy receptacle or multi-unit cable holder.

#### **31.1.3 Reserved**

#### **31.1.4 Reserved**

#### **31.1.5 Prevent Motor from Burning**

To prevent traction motors from burning and damage of other electrical equipment, do not use power to hold a standing train.

#### **31.1.6 Diesel Engine Shutdown**

To conserve fuel, on the lead locomotive consist shut down trailing diesel engines to be left standing unattended for 1 hour or longer. In addition, the lead diesel engine may also be shut down when authorized by supervisors as follows:

- In yards.
- At designated locomotive servicing and repair areas.

However, leave all diesel engines running if the outside temperature is expected to drop below 40 degrees F during the duration of the shutdown.

If the lead locomotive unit has less than 500 gallons of fuel remaining, notify the proper authority of this fact before leaving the locomotive unattended. If the lead unit is not running, leave one trailing unit running.

Contact the proper authority for information concerning the expected length of the shutdown or the expected temperature during the shutdown.



### **A. Weak Batteries**

Tag locomotives with weak batteries to prevent shutdown until the condition is corrected.

### **B. Shutdown Procedure**

Follow this procedure to shut down a locomotive:

1. Make sure the independent brake is operative and fully applied.
2. Place the generator field switch OFF.
3. Place switches or breakers for lights, heaters, refrigerator, and other accessories in the OFF position.
4. Set the hand brake
5. Remove and stow the reverser handle
6. Move the engine control switch (isolation switch) to the START/STOP/ISOLATE position.
7. After the engine has been at idle for at least 10 minutes, press the ENGINE STOP button located in the locomotive cab until the engine stops (however, if the engine has been in throttle 4 or below for at least 15 minutes, the 10-minute wait is not required).
8. Wait 5 minutes after the engine stops before opening the main battery switch (this allows for turbo lubrication during “rundown” on engines so equipped).

### **C. Starting Procedure**

Follow this procedure to start a locomotive:

1. Check the cooling water level.
2. Check that governor low oil button, over-speed trip, low water and crankcase protective devices are in the NORMAL or RESET position.
3. Check that switches or breakers for lights, heaters, refrigerator and other accessories are in the OFF position.

4. Ensure that the fuel pump breaker is ON.
5. Check that the fuel pump (engine run) and control switches on the engineer's control console are switched ON.
6. Make sure the engine control switch (isolation switch) is in the START/STOP/ISOLATION position.
7. Close the main battery switch.
8. Pull the injector control lever (layshaft) back to the NO FUEL position, and rotate the engine at least two revolutions using the start switch. If the engine becomes hard to rotate:
  - a. Do not attempt to start the engine.
  - b. Open the main battery switch and tag the isolation switch.
9. Prime the engine as follows:
  - a. On engines with a FUEL PRIME/ENGINE START switch, place the switch in the PRIME position until the sight glass is filled with fuel (no bubbles) or until the fuel pressure gauge stabilizes.
  - b. Observe the fuel flow in the fuel sight glass, when equipped (if dual sight glasses are present, the one nearer the engine block should fill with fuel).
10. Crank the engine, not longer than 20 seconds, until the engine starts. On engines so equipped:
  - a. Hold the injector control lever (layshaft) at 1/3 of its travel while cranking.
  - b. Release the lever when the engine comes up to speed.
  - c. Allow 2 minutes between cranking attempts.
11. Place switches or breakers for lights, heaters, refrigerator and other accessories in the ON position, as appropriate.
12. Check that the air brake system is charged and operative before releasing the hand brake.

13. When the locomotive is ready for service, place the engine control switch (isolation switch) in the RUN position.

The starting procedure used by mechanical personnel may include more steps than those stated above.

#### **31.1.7 Prevent Wheels Sliding**

The engineer is held responsible for overheating or sliding wheels on the locomotive.

Never move cars or locomotives with hand brakes applied to the extent that the wheels will slide.

#### **31.1.8 Separate Locomotive Units**

Before separating locomotive units:

1. Close all angle cocks and end cocks between the units to be separated.
2. Disconnect and secure electrical cables, handrail safety chains, and other connections.
3. Allow air hoses to pull apart during separation.

#### **31.1.9 Wheel Slip Warning Light**

If the wheel slip light is illuminated, reduce power until the light goes out. If light does not go out:

- Ensure that all wheels are rotating freely.
- If wheels rotate freely and wheel slip light remains on during throttle reduction, isolate affected locomotive and notify proper authority.
- If wheels do not rotate freely, set out locomotive and notify proper authority.

### **31.2 Changing Operating Ends**

Do not change operating ends until after informing crew members to stay clear of the track and equipment.

### **31.2.1 Nullify Operating Controls**

To nullify operating controls, after applying sufficient hand brakes, position equipment on the control stand as follows:

1. Levers
  - a. Put the throttle in IDLE.
  - b. Place the reverse lever in NEUTRAL and remove the handle
2. Independent brake equipment
  - a. Fully apply the independent brake.
  - b. Place the MU cutout cock in the TRAIL position.
  - c. Place the independent brake valve handle in the RELEASE position.
3. Automatic brake equipment
  - a. Make a 20-pound brake pipe reduction.
  - b. Place the brake valve cut off valve in the OUT position.
  - c. Place the automatic brake valve handle in the HANDLE OFF position.
4. Switches

Place the generator field switch OFF.

### **31.2.2 Restore Operating Controls**

To restore operating controls, position equipment on the control stand as follows:

1. Replace the reverse lever.
2. Independent brake equipment
  - a. Place the independent brake valve handle in the full application position.

- b. Place the MU cutout cock in the LEAD position.
3. Automatic brake equipment
  - a. Place the automatic brake valve handle in the RELEASE position.
  - b. Place the brake valve cutoff valve to the FRT, IN, or PASS position, as appropriate.
4. Switches
  - a. Place the generator field switch ON.
  - b. Place the control switch ON.
  - c. Place the fuel pump (engine run) switch ON.
5. Conduct the brake test as specified in Rule 30.3.3 (Procedure for Inspection and Test of Locomotive Brakes).

### **31.2.3 Operating from the Lead Controlling Unit**

When an engine has two or more units, with a unit capable of controlling the movement at each end, operate from the unit in the direction of movement. However, this is not required:

- When the movement does not exceed 2 miles and a crew member is protecting the movement.
- or
- When the movement is shoving cars.

## **31.3 Starting Trains**

### **31.3.1 Uniform Speed**

When starting a train, keep locomotive speed slow and uniform until the entire train is moving.

### **31.3.2 Verifying Brake Pipe Continuity**

Anytime a train stops, leave brakes applied or apply brakes. Use at least a 10 pound brake pipe reduction. Do not release brakes until the train is ready to proceed.

Before starting a train that has been stopped for any period of time, verify brake pipe continuity as follows:

While observing gages, release the brakes and observe an increase in brake pipe pressure as indicated by the Brake Pipe Pressure Gauge and the Air Flow Indicator Gauge.

## **31.4 Controlling The Speed of, Slowing and Stopping Trains**

### **31.4.1 Controlling Speed**

#### **A. On Freight Trains**

On freight trains, the preferred method to control speed is throttle modulation.

If this method is not practical, reduce speed as follows:

1. Make an initial brake pipe reduction, keeping the locomotive brake released by actuating the independent brake valve for at least 10 seconds after the air has stopped exhausting.
2. Allow enough time for the slack to adjust properly before making further brake pipe reductions.

On succeeding brake pipe reductions, actuate the locomotive brakes to prevent locomotive wheels from overheating or sliding.

3. After the initial brake pipe reduction, reduce the throttle gradually as train speed reduces.
4. After releasing the brakes and resuming power, stretch the slack carefully to avoid slack action and damage to the train.

**Running Release.** Do not attempt a running release if:

- Speed is not fast enough to maintain enough momentum to ensure that all brakes will release without coming to a stop.
- Total brake pipe reduction is less than 10 pounds.

## **B. Speed Reduction for Curves**

When reducing train speed for curves, where operating conditions permit, reduce speed the required amount before reaching the curve. Release the brakes before entering the curve, and allow the train to move around the curve with the brakes released.

## **C. Excessive Power**

Do not use excessive power when controlling the speed of, slowing or stopping trains.

### **31.4.2 Stopping Trains**

When a freight train will stop within the next 150 feet, do the following to stop the train:

1. Close the throttle.
2. After the train comes to a stop, apply the independent brake on all locomotives on the head end of the train.
3. If the train brakes have been used to stop, brake pipe reduction must be at least 10 pounds before releasing the train brakes.

### **31.4.3 Disturbed Track**

When roadway work or weather has affected track stability, instructions will be issued by the proper authority designating certain limits where engineers must handle their trains according to Rule 31.4.3 (Disturbed Track).

When proceeding through the limits of an area of disturbed track or wherever instructed, the engineer must use the following train handling techniques to minimize in-train forces when possible:

- Use throttle modulation.
- Avoid making slack adjustments.
- Avoid applying or releasing automatic brakes.
- Make power and brake adjustments before or after the restriction.

#### **31.4.4 Throttle Adjustments**

Gradually change the throttle to allow the slack to adjust slowly. Monitor the amperage closely when making this change.

#### **31.5 *Reserved***

#### **31.6 *Reserved***

#### **31.7 *Reserved***

#### **31.8 *Reserved***

### **31.9 *Emergency and Other Than Normal Stops***

#### **31.9.1 Use of All Available Braking Power**

When needed, use all available braking power. Use an emergency brake application without hesitating if any condition occurs in which there is doubt that service applications can control train speed.

If using an emergency brake valve, open the valve completely and leave it open until the train has stopped.

When brakes must be applied in emergency from the locomotive while using power, apply the brakes before closing the throttle.

After stopping, if there is any reason to believe the train braking system failed to perform as expected prior to or during the emergency stop, the train must not be moved until movement is authorized by the proper authority.

#### **31.9.2 Emergency Application**

If train brakes are applied in emergency, actuate the independent brakes until the train stops or the rear of the train has stopped. Place the brake valve in the EMERGENCY position and leave it there until the equalizing reservoir pressure vents to zero.

##### **A. Slack Stretched Condition**

If the train is in a slack stretched condition, move the throttle to the IDLE position as soon as practical, if power was being used when the emergency application occurred (remember that some units are equipped so that if an emergency application of brakes is received



from any source other than the cab of the controlling unit, a 20-second delay is available before the power cuts off).

### **B. Slack Bunched Condition**

If the train is in a slack bunched condition, regulate the locomotive brakes to keep the slack bunched, being careful not to slide the locomotive wheels.

### **C. Defective Control Valve**

If it is suspected that an emergency brake application is caused by a defective control valve (a “dynamiter”), and the defective valve is not found, control the train by using throttle modulation, if possible.

## **31.9.3 Train Break-In-Two**

The engineer must complete the required reports when a train separation involves knuckle or drawbar failure.

If brakes are applied in an emergency because of a train break-in-two:

1. Apply hand brakes on both portions of the train.
2. Close the angle cock at the front portion of the separation.
3. Recharge the air brake system immediately.

*EXCEPTION: If necessary to replace the knuckle or perform any work under or between the separated portions of the train, leave the angle cock on both portions of the train open while the work is being performed.*

## **31.9.4 Unknown Service Application**

If train brakes are applied with a service application from an unknown source, the engineer must:

- Leave the automatic brake valve handle in the RELEASE position.
- Keep the locomotive brakes released.
- Close the throttle gradually as train speed reduces.
- Stop as outlined in Rule 31.4.2 (Stopping Trains).

Before proceeding, the train must be inspected.

## **31.10 Penalty Brake Application**

### **31.10.1 Automatic Full Service Application**

A full service brake application occurs automatically if locomotive brakes are released and:

1. Train speed exceeds the over-speed setting.
2. On foreign line units equipped with an electronic alertness control feature, after the warning light comes on and/or the audible alarm sounds, the reset device is not pushed, or the various components on the control stand are not touched within 6 seconds.

### **31.10.2 Controlling Unit Dies Enroute**

When the controlling unit in a locomotive consist dies enroute, attempts to restart the controlling unit may result in a penalty brake application. Before attempting to restart the unit, stop the train and fully apply the independent brake.

### **31.10.3 Train Stopped After Penalty Application**

After a penalty brake application, the train must be stopped before releasing the train brakes.

#### **A. Stopping the Train After Penalty Application**

Do the following to stop the train:

1. Handle the independent brake valve as outlined in Rule 31.9.2 (Emergency Application).
2. Move the automatic brake valve handle to the SUPPRESSION position and leave it in this position until the train or locomotive has stopped.

#### **B. After the Train has Stopped**

After the train has stopped, do the following to reset the PCS and release the brakes:

1. Place the throttle in IDLE.

2. When the PCS resets, move the automatic brake valve handle to RELEASE.

### **31.11 Running Backwards**

During backup or shoving movements, do not use more power than needed to start the movement smoothly. Always use the least possible power when shoving through sharp curves and turnouts or across bridges.

When making a stop with a train moving backward, and the locomotive is on the head end only, the engineer must:

1. Keep the locomotive brakes released and the slack bunched by working the power until the train stops to avoid a run-out or possible break-in-two.
2. Gradually reduce the throttle as train speed decreases.

### **31.12 Defective Brakes and Equipment**

#### **31.12.1 Operative Air Brakes**

While a train is running, it must have operative air brakes on all cars (except scale test cars not equipped with air brakes), unless the brakes fail enroute.

Air brake operating requirements are as follows:

1. Make sure at least 85 percent of the cars in a train have operative air brakes.
2. If air brakes must be cut out on two cars in a series, separate the cars at the first available point so as not to prevent an emergency application of brake throughout the train.
3. Make sure the brakes on the car next to the locomotive and on the rear car are always cut in and operative, except during an emergency.
4. Notify the proper authority of cars set out and conditions found. Attach a tag on or near the defective equipment and note the defect on the tag.

### **31.12.2 Cutting Out Brakes**

Cut out brakes by completing the following steps:

1. If the car is equipped with brake cylinder cutout cocks, close the cutout cocks.
2. If the car is not equipped with brake cylinder cutout cocks, do the following:
  - a. Close the branch pipe cutout cock.
  - b. Drain the air reservoirs by opening the release valve.
  - c. Block or wire the release valve open.
3. When necessary to cut out the air brake on a car enroute, notify the proper authority and, when possible, the repair forces at the next repair point.

### **31.12.3 Total Air Brake Failure Enroute**

If the air brakes totally fail enroute and no other locomotive is available, do not move the train unless it can be moved safely. In addition:

- If the train must be moved, move it only to the first available siding.
- Immediately apply hand brakes and block the locomotive wheels.
- Notify the proper authority.

### **31.12.4 Air Hoses Separate or Cars Uncouple Enroute**

If air hoses separate enroute, do the following:

- If the hoses seem to be in the proper condition, replace air hose gaskets and, when possible, wire, tie or tape glad-hands together.
- If the hoses need replacing or an extension (dummy air hose) must be used, stretch the connection before proceeding.
- If a dummy air hose is used, support it so it will not drag if the slack is bunched.

If the same air hoses separate a second time enroute and it can be determined which car is causing the separation, set it out; otherwise, set out both cars.

If cars uncouple enroute and both couplers appear to be in the proper condition, they should be re-coupled and stretched before proceeding. If the same cars uncouple a second time and it is known which car is causing the uncoupling, set that car out; otherwise, set both cars out.

## ***31.13 Handling Shutdown or Isolated Locomotives***

### **31.13.1 Inspection Requirements**

Verify that the wheels rotate freely, and observe the wheels frequently enroute, since wheel slip protection is not provided on isolated/shutdown units.

### **31.13.2 Reserved**

### **31.13.3 Reserved**

### **31.13.4 Units Isolated, Shutdown or Failed Enroute**

When a unit fails enroute, causing the engine to be shut down or isolated for any reason, the engineer must immediately contact the proper authority.

#### **A. Prevent Engine Cooling System from Freezing**

The engineer is responsible for preventing locomotive freeze damage. Whenever ambient temperature is expected to be 32 degrees F or less the engineer must take action to prevent locomotive freeze damage as follows:

1. If a unit is known to have died or been shut down, or when an engine alarm indicates a trailing unit may have died, the engineer must immediately contact the proper authority.
2. A supervisor will advise where the engineer can stop the train to attempt to start a dead unit.
3. If the unit cannot be started, the engineer must then manually drain the engine, leaving drain valves open.

## **B. Do Not Isolate Controlling Unit**

The controlling unit of a locomotive consist must be on line while the train or engine is moving, unless the unit is not operating properly.

## **C. Tagging Requirements**

The engineer is responsible for attaching a tag on the isolation switch of the unit being shut down or isolated enroute; the tag must describe the reason for the shut down or isolated unit. This includes units being shut down or isolated for fuel conservation.

## **32 MISCELLANEOUS AIR BRAKE RULES**

### **32.1 *Blocking Independent Brake***

The independent brake valve must not be blocked in the actuating position.

### **32.2 *Air Gauges***

The engineer must frequently observe air gauges to always know that the brakes are functioning properly.

### **32.3 *Slack In Train***

The engineer is responsible for properly controlling the slack in the train.

### **32.4 *Reserved***

### **32.5 *Overcharged Air Brake System***

To help prevent an overcharge when switching the rear portion of a freight train that has a charged brake system, the engineer must make a full service brake application before opening the angle cocks.

Follow these steps to respond to an overcharged brake system:

1. Make a full service application and release.
2. If the train brakes still do not release, apply the emergency brake to reduce the auxiliary and emergency reservoir pressures, and then release brakes.
3. If brakes on any car will not release, refer to Rules 31.12.1 (Operative Air Brakes) and 31.12.2 (Cutting Out Brakes) for cutting out brakes on that car.
4. Verify that all brakes are released before proceeding.

### **32.6 *Do Not Adjust Air Brake Controls***

While the train or engine is moving, do not:

- Adjust the regulating valve on the controlling locomotive.
- or
- Cut out the automatic brake valve on the controlling locomotive.

## **32.7 Main Reservoir Pressure When Charging**

During initial brake pipe charging, the locomotive main reservoir pressure may temporarily drop. If the main reservoir pressure drops to less than 15 pounds above the regulating valve setting, follow this procedure:

1. Center the reverse lever.
2. Place the generator field switch OFF.
3. Increase the throttle, but do not exceed Run 4.
4. When the main reservoir pressure increases to 15 pounds above the regulating valve setting, return the throttle to IDLE.

## **32.8 Locomotive Reversed**

Do not position the reverse lever opposite to the direction of travel when a locomotive is moving.

## **32.9 Speed and Amperage of Locomotive Consist**

Do not operate a locomotive consist at speeds higher than those specified for the unit with the lowest maximum speed.

Locomotive units equipped with computer microprocessors provide self-protection and do not have a short time limitation even if there is a red zone on the ammeter.

When operating close to continuous rating under full power, do not operate a locomotive consist at amperage higher than that for the unit with the lowest maximum amperage, as listed on the chart in each unit.

## **32.10 Wheel Slip Warning Lights**

If the wheel slip warning light blinks on and off intermittently, or it remains on continuously for more than a few seconds, reduce power. If the warning continues after power is reduced, stop the train and verify that all locomotive wheels are rotating freely.

## **32.11 Reserved**



## **33 RULES FOR LOCOMOTIVE AND CAR INSPECTION FORCES**

### **33.1 *General Rules for Inspection Forces***

#### **33.1.1 Brake Equipment Inspection**

Periodically inspect and test brake equipment on locomotives and cars according to the following:

- Federal Railroad Administration regulations.
- Association of American Railroads standards.
- Company procedures and special instructions.

The following requirements also apply:

1. Rules in Chapter 33 apply to all employees who are responsible for the proper inspection of locomotives and cars.
2. In addition to the rules in this chapter, locomotive and car inspection forces must comply with all company procedures and special instructions that apply to their work.
3. In addition to the rules in this chapter, locomotive and car inspection forces must comply with the following Air Brake and Train Handling Rules:
  - a. Rules in Chapter 30, including 30.1, 30.2 and 30.8.
  - b. Rules in Chapter 31, including 31.1.1, 31.1.2, 31.1.6, 31.1.7, 31.1.8, 31.2, 31.10.3, 31.12 and 31.13.
  - c. Rules in Chapter 32, including 32.7.

#### **33.1.2 Use of Release Rod**

On trains with a charged brake system, use the release rod only if necessary. Excessive use of the release feature will cause brakes to apply and possibly stick on cars near the car being bled.

#### **33.1.3 Safety or Protective Device**

Do not block or cut out any safety or protective device.

### **33.2 Locomotive Consist Departure Test**

Before releasing a locomotive consist for service, conduct a test as outlined in rule 30.3, (Locomotive Consist Air Brake Tests).

### **33.3 Initial Terminal Test**

The inspector will do the following while the train is being charged:

- Inspect for defects.
- Ensure that air hoses are coupled and angle cocks are opened.
- Ensure that brakes are cut in and retaining valve handles are properly positioned.
- Repair all air leaks during the inspection.

### **33.4 Preparation of Locomotives for Movement Dead-In-Train (DIT)**

#### **33.4.1 Control Valves for Air-Operated Devices**

Make sure that supply valves are closed for air-operated devices that take air from the main reservoir. If the unit is equipped, leave the drain cock on the control air reservoir open, and make sure the main battery switch is also open.

#### **33.4.2 Reserved**

#### **33.4.3 Reserved**

#### **33.4.4 Preparation of 26L Equipment**

Follow these steps to prepare 26-L equipment:

1. Place the independent brake valve handle in the RELEASE position and remove the handle or secure it in place.
2. Place the automatic brake valve in the HANDLE OFF position and remove the handle.
3. Depress the brake valve cutoff valve and move it to the OUT position.

4. Open the MU cutout cock or place it in the LEAD OR DEAD position.
5. Open the application and release pipe cutout cock at the ends of the locomotive.

#### **33.4.5 Full Service Brake Pipe Reduction**

With any brake equipment, before closing the brake pipe cutout valve or brake valve cutoff valve, make a full service brake pipe reduction if the brake system is charged. After properly blocking the brake equipment and, if possible, before placing it in the train:

1. Drain the main reservoirs and recharge them through the dead engine feature.
2. Conduct a brake pipe leakage test and an application and release test from another locomotive or source of air supply.

When the main reservoir pressure is charged through the dead engine feature, the pressure will be considerably less than normal.

### **33.5 Freezing Weather Precautions**

All employees are responsible for preventing the engine cooling systems from freezing. If the engine is shut down or dies and it cannot be restarted, employees must do the following:

1. Verify that the automatic drain valve (if equipped) has operated.  
  
or
2. Manually drain the engine if ambient temperature is expected to be 32 degrees F or lower.

### **33.6 Locomotive Shut Down Procedures**

Complete these steps when shutting down a locomotive:

1. Perform all steps outlined in Rule 31.1.6B (Shutdown Procedure).
2. Open each cylinder test cock three turns.
3. Open the main reservoir drains.

### **33.7 Locomotive Starting Procedures**

Complete these steps when starting a locomotive:

1. Close the main reservoir drains.
2. Perform steps 1 through 8 in Rule 31.1.6C (Starting Procedure).
3. With all cylinder test cocks open, rotate the engine a few revolutions with the starter, checking the test cocks for indication of water leaks.
4. Close all cylinder test cocks.
5. Perform steps 9 through 13 in Rule 31.1.6C (Starting Procedure).
6. Check the lube oil pressure and ground relay reset.
7. When the locomotive is ready for service, place the engine control switch (isolation switch) in the RUN position.

### **33.8 Brake Shoe Application**

All cars designed for composition brake shoes must have brake heads designed with cast iron brake shoe rejection lugs. Applying the wrong brake shoes drastically changes the braking capability and can lead to wheel failure.

### **33.9 Air Compressors**

Use only the appropriate oil in the air compressor crankcase. Make sure enough oil is in the air compressor crankcase as follows:

1. Check the splash proof bayonet gauge or oil level indicator.
2. If the oil level is below the low mark and no air compressor oil is available, shut down the engine.

### **33.10 Locomotive Daily Inspection by Mechanical Forces**

#### **33.10.1 Requirements of Inspection**

Before releasing an engine for service, verify the following:

1. The brakes operate properly.

2. The air compressors are in good condition and provide enough air for the intended service.
3. The devices for regulating all pressures operate as intended.
4. The air gauge indicates the pressure correctly.
5. The air brake valves work as intended in all positions.
6. Any water has been drained from the air brake system.

Display the Locomotive Inspection & Repair Record (form FRA F 6180-49A) in the locomotive cab. Make sure the card contains the dates, location and person conducting the current and previous periodic, annual and bi-annual tests.

If the form FRA F 6180-49A is missing, notify the proper authority for instructions for replacing the form.

### **33.10.2 Inspection by Mechanical Forces**

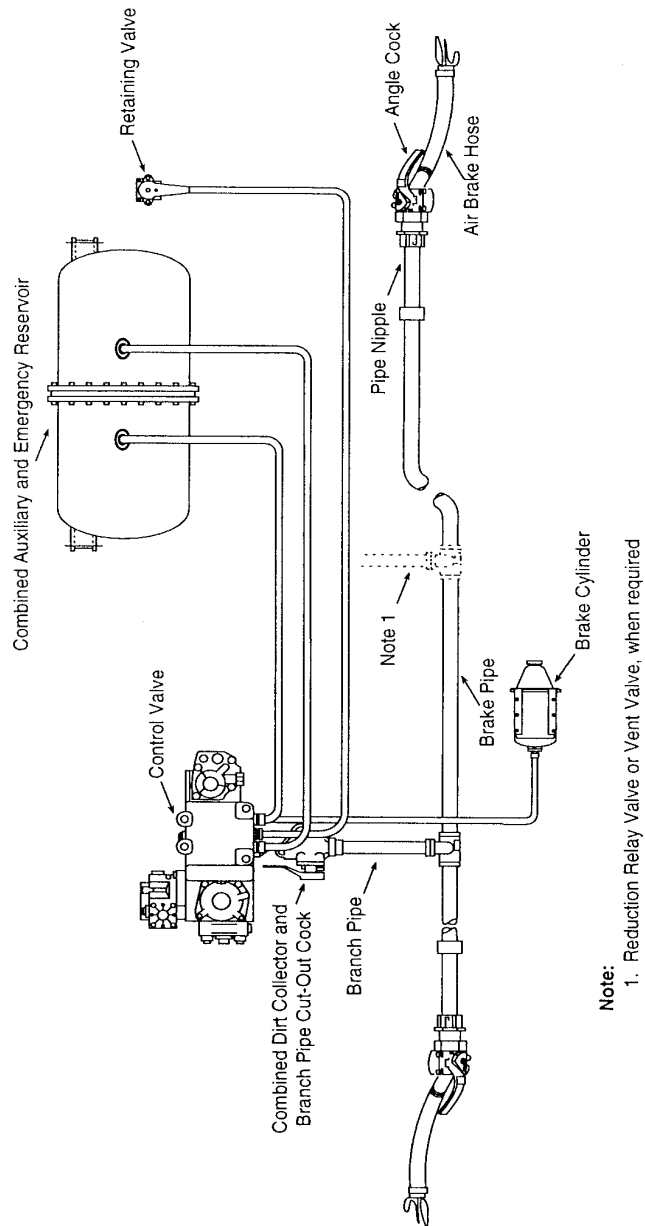
In addition to the requirements outlined in Rule 30.7 (Locomotive Daily Inspection), the following requirements apply when mechanical inspection forces inspect the unit:

1. Standard pressures are as follows:
  - a. Independent brake pressure with cast metal brake shoes: 45 PSI.
  - b. Independent brake pressure with composition brake shoes: 72 PSI.
  - c. Main reservoir safety valve: 150 PSI.
2. Locomotive piston travel is adjusted to nominal travel when possible, but must not exceed 1-1/2 inches less than maximum travel as follows:
  - a. Switch engines and yard slugs: 3 inches nominal; 6 inches maximum.
  - b. Two- and three-axle trucks with high cylinders: 3 inches nominal; 8 inches maximum.
  - c. Three-axle trucks with one high cylinder: 3 inches nominal; 10 inches maximum.

- d. Three-axle trucks with three or four low cylinders: 1 inch nominal; 6 inches maximum.
- 3. Foundation brake gear is maintained in a safe and suitable condition for service as follows:
  - a. Levers, rods, brake beams, hangers and pins are in serviceable condition and are not fouled in any way that will affect proper brake operation.
  - b. All pins are properly secured in place with cotters, split keys or nuts.
  - c. Brake shoes are properly applied and kept approximately inline with the tread of the wheel.
  - d. All parts of the foundation brake gear are at least 2-1/2 inches above the rail.
- 4. The Inspection Record Card located in the cab of the unit is completed to include the current calendar date and time entered. In addition, a Locomotive Inspection Record is completed and kept at the inspection point or forwarded to the location responsible for keeping the record.
- 5. Main reservoirs are drained of water and foreign matter before the unit is released for service. Automatic drains, if equipped, are operative.

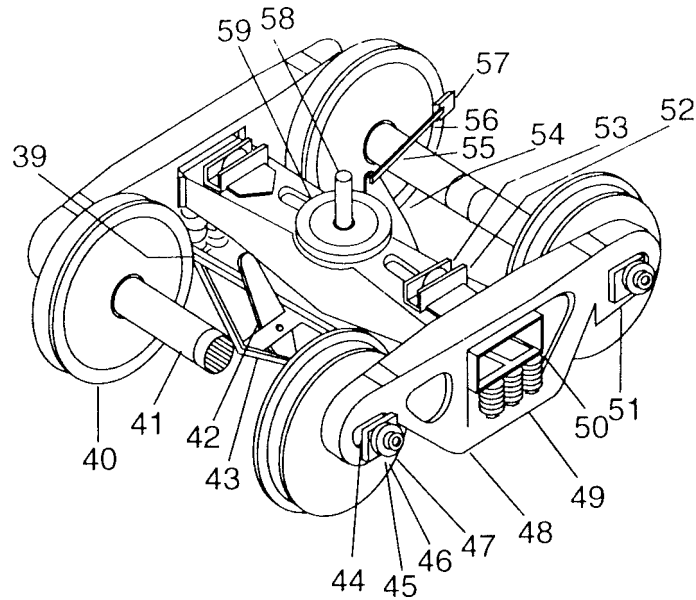
## 34 CHARTS AND DIAGRAMS

### 34A - Single Capacity Freight Car Air Brake Equipment



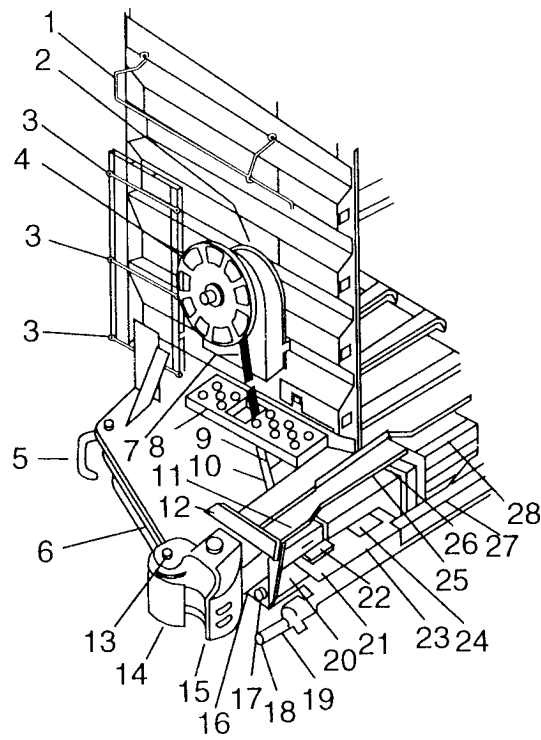
### 34B - Car Chart Figure 1

(refer to 34F for car chart components)



### 34C - Car Chart Figure 2

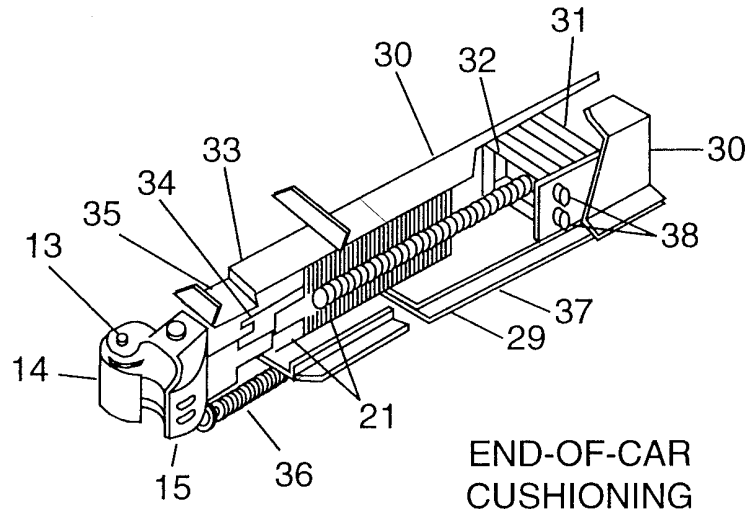
(refer to 34F for car chart components)





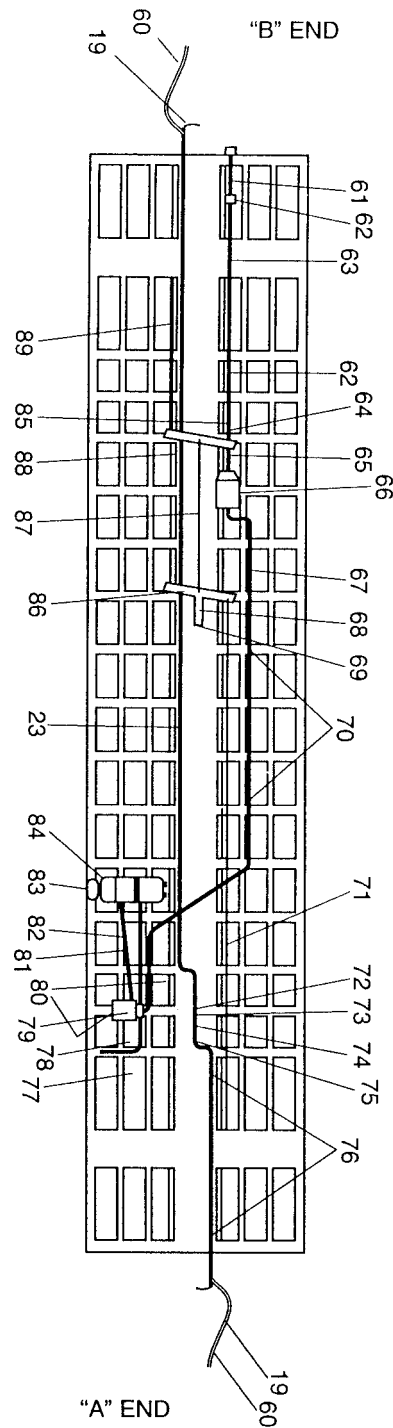
### 34D - Car Chart Figure 3

(refer to 34F for car chart components)



### 34E - Car Chart Figure 4

(refer to 34F for car chart components)



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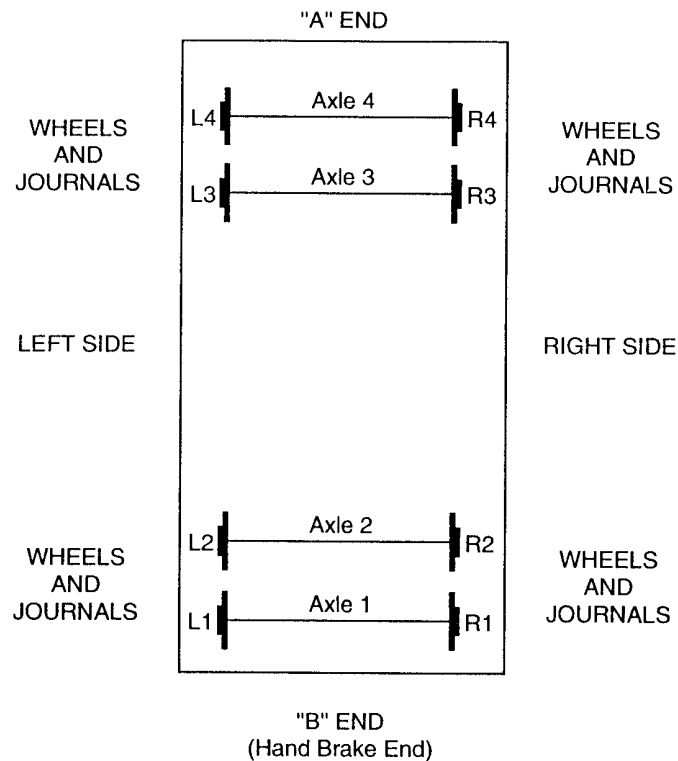
## 34F - Car Chart Components

1. Horizontal end hand hold
2. Hand brake housing
3. End ladder tread
4. Hand brake wheel
5. Telescoping uncoupling rod
6. Uncoupling lever guide
7. Hand brake chain
8. End platform (combined crossover and brake step)
9. Bell crank
10. Vertical hand brake rod
11. Front draft gear stop
12. Striker
13. Coupler knuckle pin
14. Coupler knuckle
15. Type E coupler head
16. Coupler carrier
17. Coupler wear plate
18. Striker flange
19. Angle cock
20. Draft key washer
21. Draft key
22. Draft key retainer
23. Brake pipe, 1-1/4" (Train line)
24. Follower block
25. Coupler yoke
26. Draft gear
27. Rear draft gear stop
28. Rear draft gear stop reinforcement
29. Hydraulic piston
30. Center sill
31. Back stop plate
32. Rear lug casting
33. Striker casting
34. Coupler key
35. Cushioning unit
36. Restoring mechanism
37. Inspection plate
38. Rear cross key
39. Brake shoe
40. Wheel
41. Axle
42. Truck live lever
43. Brake beam
44. Roller bearing adapter
45. Roller bearing end cap
46. End cap retaining bolt
47. End cap locking plate
48. Truck side frame
49. Truck spring
50. Truck bolster
51. Roller bearing assembly
52. Truck side bearing roller
53. Truck side bearing housing
54. Truck dead lever
55. Clevis at dead lever
56. Clevis at dead lever fulcrum
57. Dead lever anchor—  
underframe mounted
58. Center pin
59. Truck center plate cast integral  
with truck bolster
60. Air hose
61. Hand brake chain at bell crank
62. Hand brake rod guide
63. Hand brake rod
64. Hand brake chain at cylinder
65. Cylinder push rod
66. Air brake cylinder
67. Cylinder pipe, 3/4"
68. Floating lever guide
69. Floating lever
70. Pipe clamp, 3/4"
71. Top rod "A" end
72. Branch pipe tee
73. Branch pipe tee support
74. Combined dirt collector and  
cutout cock
75. Connection hose
76. Pipe clamp, 1-1/4"
77. Retainer pipe
78. Retainer valve
79. ABD control valve
80. Release rod
81. Auxiliary reservoir pipe, 3/4"
82. Emergency reservoir pipe, 3/4"
83. Reservoir support
84. Combined auxiliary and  
emergency reservoir
85. Cylinder lever guide
86. Brake lever fulcrum
87. Brake slack adjuster
88. Cylinder lever
89. Top rod "B" end

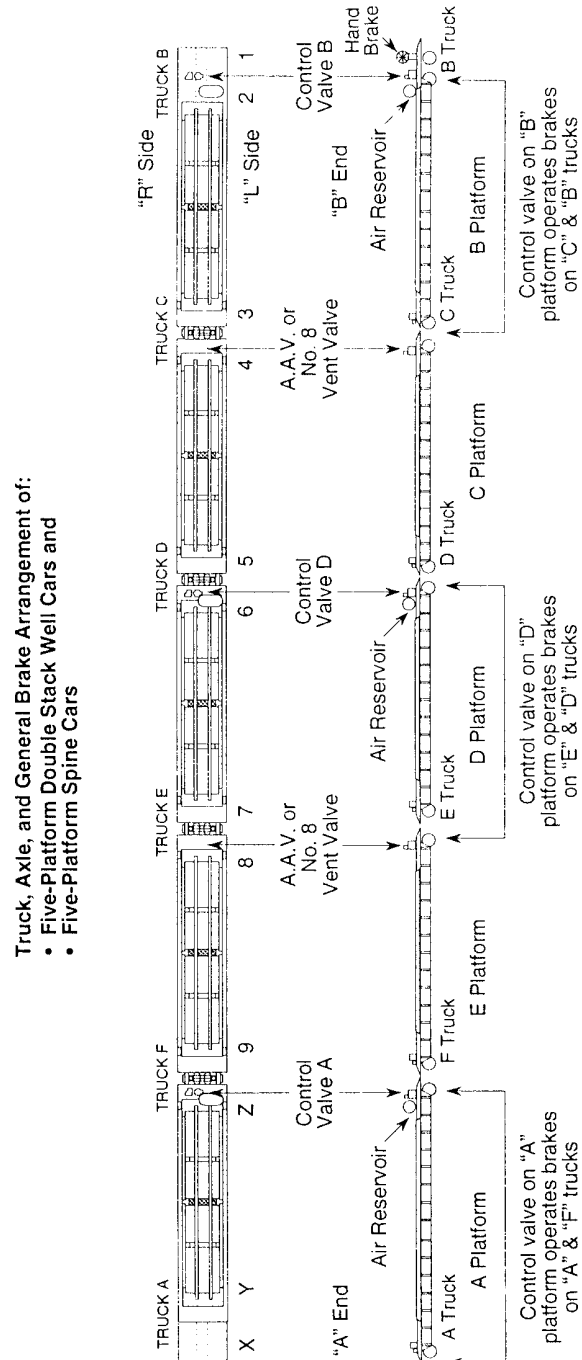
## 34G - Freight Car Axle, Journal and Wheel Identification

To determine axle number, journal number, and wheel number on a car, stand facing the hand brake end of the car (the "B" end) and count the closest axle as number one and the wheels and journals on right and left sides as R1, R2, etc. and L1, L2, etc. respectively as shown in the diagram.

**Note:** For all multi-unit articulated cars, the journal-wheel number will be stenciled on the side frame directly above the journal.



## 34H - Terminology for Articulated Car Identification



## 34H - Terminology for Articulated Car Identification (continued)

**Control Valve.** Operates truck-mounted brakes. It consists of two valve portions bolted to a pipe bracket and has a cutout cock. It is located by the air reservoir. Each control valve operates the brakes on two trucks:

- The control valve on the "A" platform operates the brakes on "A" and "F" trucks.
- The control valve on the "D" platform operates the brakes on "E" and "D" trucks.
- The control valve on the "B" platform operates the brakes on "C" and "B" trucks.

**A.A.V. (Accelerated Application Valve).** Does not operate brakes, but does propagate the signal to operate brakes. It consists of one valve portion bolted to a pipe bracket and has a cutout cock. However, do not cut out the A.A.V. unless there is a continuous blow of air through the valve.

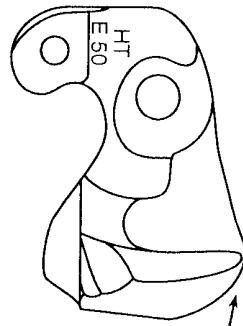
**No. 8 Vent Valve.** Does not operate brakes, but does propagate the signal to operate brakes. It consists of a single vent valve and does not have a cutout cock. It does have a plug that can be installed if there is a continuous blow of air through the valve.

**Hand Brakes.** Five platform cars have a hand brake on the "B" platform. Also, there may be a hand brake on the "A" platform. When there are hand brakes on both the "A" and "B" platforms, they are painted orange. If the car is set out and the use of hand brakes is necessary, apply both hand brakes.

## 34I - Coupler Identification

### KNOW YOUR COUPLERS

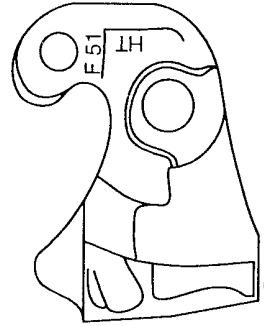
NUCKLES MARKED "E 50"  
FIT "E" TYPE COUPLERS



ROUND  
CORNER

TYPE "E"

NUCKLES MARKED "F 51"  
FIT "F" TYPE COUPLERS

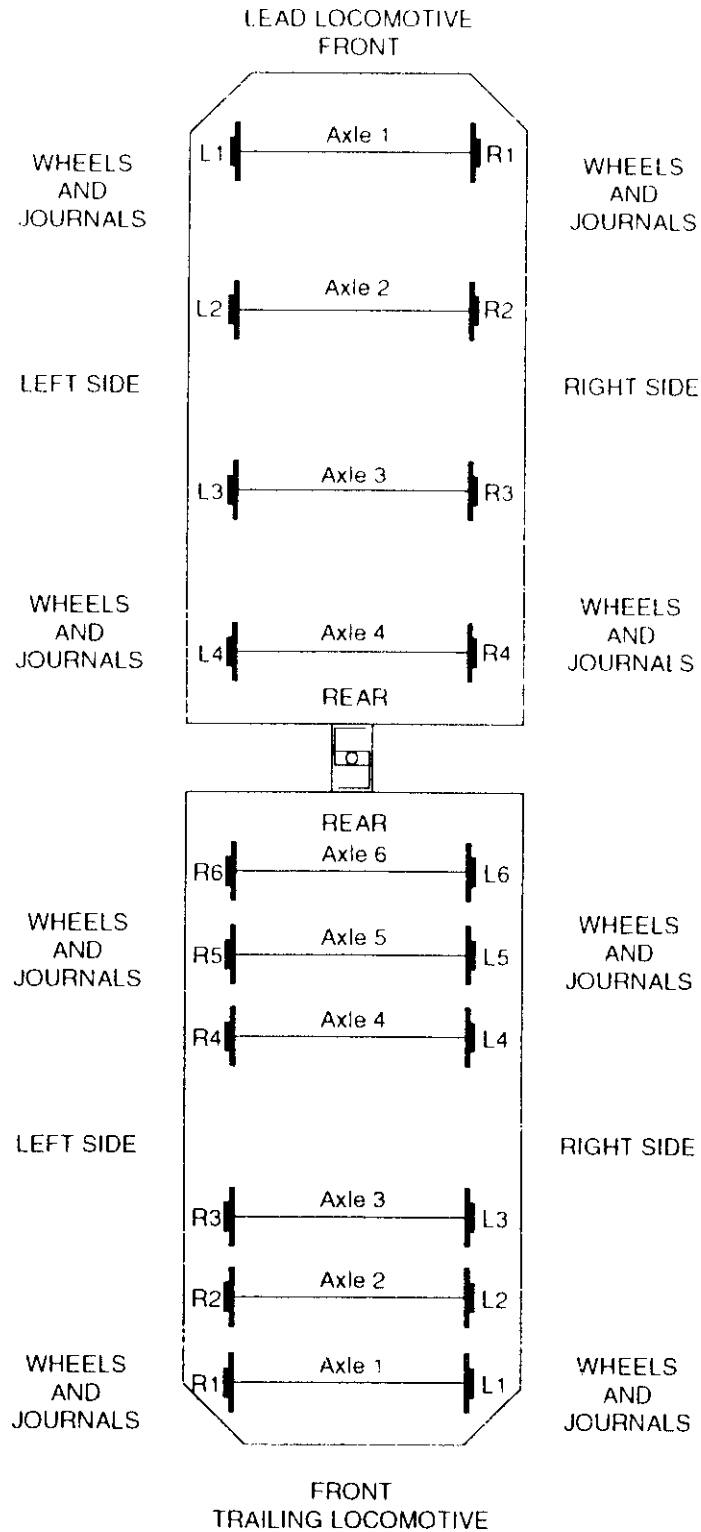


SQUARE  
CORNER

TYPE "F"

NUCKLES ARE NOT INTERCHANGABLE

## 34J - Locomotive Axle, Journal and Wheel Identification





## GLOSSARY

**Accelerometer** - An indicator that displays in MPH per minute the rate of increase/decrease of speed.

**Actuating** - Depressing the independent brake valve handle, which charges the actuating pipe from the main reservoir and releases the automatic brakes on each locomotive in the consist (also referred to as “bailing off”).

**Air Brake** - A system of compressed air devices controlled manually or pneumatically, that make the car or locomotive slow down or stop.

**Air Brake Equipment** - The equipment that supplies and exhausts air to and from the brake cylinders, but does not include foundation brake gear and hand brakes.

**Air Brake Hose** - A reinforced tubing. On each car or engine, the tubing is attached to a nipple that screws into the angle cock at the end of the brake pipe. The other end of the hose includes a coupling (glad hand) that fits into an identical coupling on the adjoining car. The complete arrangement connects air between the brake pipes of the cars and the locomotives throughout the train.

**Air Brake System** - All of the devices for operating air brakes to control the speed of, and stop, a locomotive or train. The system includes the operating devices, pipes, hoses, fittings and foundation brake gear.

**Air Compressor** - A locomotive device powered by the diesel engine or an electric motor that compresses air for operating the air brakes and all other air-operated devices on locomotives and cars.

**Air Compressor Control Switch** - A device to control the loading and unloading of the compressor at the proper main reservoir pressure settings.

**Air Flow Indicator (AFI)** - An instrument that indicates the volume of the air flowing through the automatic brake valve into the brake pipe.

**Air Gauge** - An instrument that indicates air pressure in pounds per square inch (PSI).

**Alignment Control Couplers** - Specially equipped couplers, installed on most locomotives, that let the coupler in buff move laterally within certain limits. This equipment restricts lateral movement of the coupler and reduces lateral forces on the track. As a result, rails are less likely to turn over, and locomotive consists are less likely to jackknife.

**Ampere (Amperage, Amps)** - The standard unit for measuring electric current.

**Angle Cock** - A manually operated device located at each end of the brake pipe on locomotives and cars to permit or prevent airflow.

**Articulated Multi-platform Car** – A car with multiple units (segments) that have articulated couplings and in which the units share a common truck.

**Automatic Brake Valve** - A manually operated pneumatic valve on the locomotive that controls the train and engine brakes.

**Auxiliary Reservoir** - A storage volume charged from the brake pipe, to receive and store air to apply brakes on a car or locomotive. In freight car equipment, the auxiliary reservoir and emergency reservoir are combined in one structure.

**“B” End (of car)** - The end of the car where the hand brake is located unless otherwise identified.

**Back-up Valve or Hose** - A device, either portable or permanently connected to the brake pipe, that controls brakes from the car that it is attached to. The device can apply the brakes with a service or emergency application.

**Bleed (Bleed-off)** - Venting air pressure to the atmosphere, such as venting air pressure from the brake cylinder of individual cars, by using the release valve.

**Brake Application** - A brake pipe pressure reduction (no matter how made) that causes the control or distributing valve to move to the service or emergency position.

**Brake Cylinder** - The metal cylinder mounted on a car or locomotive containing a piston and piston rod, to which are attached brake levers. Compressed air forces the piston outward to move the levers and apply the brakes. When the air pressure is released, the piston is returned to its normal position by a release spring coiled around the piston rod inside the cylinder, thus releasing the brakes.

**Brake Pipe** - The section of piping on a car or locomotive that supplies air to the reservoirs. It also connects the piping to allow the locomotive engineer to control the car brakes. The pipe is 1-1/4 inches in diameter and extends from one end of the car to the other. At the ends, flexible hoses connect the cars. When a train is made up and all brake pipes on the cars are joined together, the entire pipeline is called the brake pipe.

**Brake Pipe Gradient** - The difference in brake pipe pressure between the locomotive (or source of supply) and the rear car of the train. Brake pipe gradients may be:

1. **Normal Gradient.** The gradient that exists when the system is fully charged.
2. **False Gradient.** The temporary gradient that exists when the system is less than fully charged (for example, the exaggerated difference between the head end and rear end after a release).

3. **Inverse Gradient.** The temporary condition when the brake pipe pressure is higher at the rear of the train than at the head of the train (for example, during a service brake application).

**Brake Pipe Pressure** - The amount of air pressure and expressed in pounds per square inch (PSI) in the brake pipe.

**Brake Valve Cutoff Valve** - A device on locomotives that can cut out the charging and service functions of the automatic brake valve. This valve also properly positions the brake valve for passenger or freight operation.

**Branch Pipe Cutout Cock** - A device on locomotives and cars that isolates the control valve from the brake pipe.

**Buff Forces** - A term used to describe compressive coupler forces in a train. Buff forces bunch the slack in a train.

**Consist** - The term “consist” usually refers to a set of locomotives coupled together to pull a train. The term may also be used to refer to an entire train: its locomotives and all its cars.

**Control Valve** - A device on locomotives or cars that charges the reservoirs and applies or releases brake cylinder pressure when brake pipe pressure reduces or increases.

**Dead Engine Feature** - A device near the locomotive control valve that is used when the unit is handled dead-in-train. When the dead engine cutout cock is opened, the main reservoirs are charged from the brake pipe to operate the engine brakes.

**Disturbed Track** - A section of passable track that has a temporary speed restriction imposed because various defects or track maintenance have affected the integrity of the track.

**Draft Forces** - A term used to describe tension coupler forces in a train. Draft forces stretch out the slack in a train.

**Draft Gear** - The connection between the coupler rigging and the center sill. This connection receives and cushions the shock associated with in-train forces or coupling.

**Drawbar Forces (In-train Forces)** - The forces exerted at the couplers, between cars and/or locomotives, that may be either draft (stretched) or buff (compressed), depending on train operation.

**Dynamic Brake** - An electrical device that converts some of the energy developed by a moving locomotive into an effective retarding force.

**Dynamic Brake Interlock (DBI)** - A device that will automatically keep the locomotive brakes from applying when automatic brakes are applied during dynamic braking.

**Electronic Alertness Control** - A safety control system that senses the activity of the engineer. As the engineer goes about normal activities, any such changes will reset the control and start a timing circuit. If, during the timing period, no additional activity is detected, an audible and/or visual alarm will activate and initiate a penalty brake application if no further action is taken.

**Emergency Application** - A rapid reduction of brake pipe pressure that causes the control valves to move to the emergency position and the vent valves to open. This equalizes auxiliary reservoir, emergency reservoir and brake cylinder pressures.

**Emergency Brake Valve** - A manually operated device on equipment that initiates an emergency brake application.

**Emergency Reservoir** - A storage volume, charged from the brake pipe, to receive and store air used during emergency brake applications and certain recharge features.

**End of Train Telemetry Device (EOT)** - A system of components that determines the rear car brake pipe pressure and transmits that information to the display on the controlling unit.

**Engine/Locomotive** - A self-propelled unit of equipment designed for moving other railroad rolling equipment in revenue service including a self-propelled unit designed to carry freight or passenger traffic, or both, and may consist of one or more units operated from a single control.

**Equalization** - A term used to describe the condition that exists when brake cylinder pressure and auxiliary reservoir pressure become equal.

**Equalizing Reservoir** - A small reservoir connected to a piston or diaphragm chamber and used in automatic air brake operations. It is only cut in on the controlling unit. The reservoir's purpose is to add a volume of air to one side of the chamber, which can be accurately controlled. When a brake pipe reduction occurs, air is drawn from the equalizing reservoir. The reservoir then automatically draws the proper amount of air from the brake pipe. For this reason, the brake pipe pressure and the equalizing reservoir pressure are always the same, except when they are equalizing after a brake pipe reduction or a brake pipe charging operation.

**Foundation Brake Gear** - The levers, rods, brake beams, etc. that connect the brake cylinder piston rod to the brake shoes so that when air pressure forces the piston out, the brake shoes are forced against the wheels.

**Full Service Application** - A brake pipe reduction made only to the point at which the auxiliary reservoir and brake cylinder pressures equalize. Any further reduction in the brake pipe pressure, except an emergency application, will not affect the amount of pressure in the brake cylinder. Therefore, air is being wasted from the brake pipe (over reduction).

The chart below shows the reduction needed for a full-service application for various initial brake pipe pressures. Also listed is the brake cylinder pressure at full service for various initial brake pipe pressures:

Initial Brake Pipe Pressure	Service Equalization Pressure	Brake Pipe Reduction to Obtain Equalization
90 psi	64 psi	26 psi
105 psi	75 psi	30 psi
110 psi	78 psi	32 psi

**Grade (of Track)** - Grade is other than level track and is usually expressed as a percentage. The percentage is the number of feet the track rises or falls in a distance of 100 feet. For example, a 1-percent ascending grade means that the track rises 1 foot in elevation for every 100 feet the equipment travels on the track. Unsecured rail equipment may roll on a grade (exceeding 1 percent is considered a heavy grade).

**Hand Brake** - A mechanical arrangement of levers, chains, rods, gears and fulcrum. When applied manually by wheel or lever, the hand brake forces the brake shoes against the braking surfaces (wheel tread or disc) to control car or locomotive movement.

**Helper** - One or more manned locomotives added to a train to assist movement.

**Horsepower per Trailing Ton** - The total horsepower of all working locomotives divided by the total of trailing weight of the train in tons. For example, a train powered by 15,000 horsepower and having a trailing weight of 4,285 tons has a 3.5 horsepower per trailing ton ratio (15,000 HP divided by 4,285 tons).

**Independent Brake Valve** - A brake valve that controls the locomotive brakes independent of the automatic brake valve handle position.

**Independent Pressure Switch (IPS)** - A device on a locomotive that cancels the extended range portion of dynamic braking when a sufficient independent brake application occurs. This switch prevents the locomotive wheels from sliding because of excessive braking.

**Initial Terminal** - Means a location where a train is originally assembled.

**Interchange** - A location where railroads exchange rolling equipment.

**Intermodal Equipment** - Equipment designed to carry trailers, containers or automobiles.

**Isolation Switch** - A switch on diesel electric locomotives that has two or three positions. In the RUN position, the unit is “on line,” responds to control and develops power. In the ISOLATION (or STOP/START) position, the unit is isolated from the consist and does not develop power or respond to control.

**Light Locomotive** - One or more units, not coupled to cars.

**Main Reservoir** - An air reservoir on the locomotive for storing and cooling compressed air.

**Minimum Reduction** - The first position of the automatic brake valve that initiates a service application of 6 to 8 PSI.

**MU Cutout Cock (MU-2-A, Dual-Ported Cutout Cock)** - A device for cutting in or out the independent brake valve.

**Multiple Unit (MU)** - Lead locomotive followed by one or more locomotives. Cables and hose connections between the locomotives allow control of the trailing units from the lead locomotive.

**Off Air** - Not connected to a continuous source of compressed air of at least 60 PSI.

**Overcharge** - Brake equipment charged to a higher pressure than the regulating valve is adjusted for or can maintain. In such a condition, brakes on a portion of the train may not release.

**Penalty Brake Application** - An automatic full service brake application caused by various safety devices.

**Pneumatic Control Switch (PCS)** - An air-operated switch, activated by an emergency or penalty brake application, that drops the engine speed to idle.

**Pressure Maintaining Braking** - Controlling train speed by making enough of a brake pipe reduction to stabilize speed on a grade, then allowing the automatic brake valve pressure maintaining feature to hold the brake application constant regardless of brake pipe leakage.

**Pressure Maintaining Feature** - A system designed to overcome brake pipe leakage both in the RELEASE and SERVICE positions of the automatic brake valve. This allows a constant brake application to be held as long as needed.

**Reduction (of the brake pipe)** - A decrease in brake pipe pressure at a rate and of an amount sufficient to cause a train brake application to be initiated or increased.

**Reduction Relay Valve** - A device on long cars that helps brake pipe pressure reduce during service and emergency brake applications. The valve compensates for the added length of brake pipe on long cars.

**Regulating Valve** - The valve that reduces air pressure from the locomotive's main reservoir to the desired pressure in the brake pipe. The regulating valve will automatically maintain that pressure when the automatic brake valve is in the RELEASE position.

**Retaining Valve** - A manually operated valve used on cars to exhaust brake cylinder pressure completely or to maintain a predetermined pressure.

**Service Application** - When brake pipe pressure exhausts at a service rate to apply the train brakes.

**Slack Action** - Movement of part of a coupled train at a different speed than another part of the same train.

**Slug** - A unit with traction motors but no diesel engine and incapable of propelling itself. The unit receives electrical power through a power cable from an adjacent, specially equipped locomotive. Slugs are used where low speeds and high tractive effort are needed.

**Solid Block (of cars)** - One or more cars coupled together that are charged, are tested as outlined in Rule 30.2.2 (Procedure for Inspection and Test) and have an air brake system that: remains charged or is disconnected from its air supply for less than 2 hours.

**Split Service Reduction** - A term describing a method of making an air brake application in two or more steps to produce a more uniform application.

**String-Lining** - Cars pulled off the inside of curves, trying to approach a straight line when the train is in draft.

**Thermal Cracks (in wheels)** - Cracks in a railroad wheel, normally caused by heat generated on the tread and flange of the wheel from excessive braking.

**Throttle Modulation** - The action of adjusting the throttle one notch at a time between idle and position 8 to control train speed without the application of air brakes.

**Tons per Dynamic Brake Axle** - The total gross trailing tonnage of the train divided by the numbers of axles of locomotives, including helper locomotives, operating in dynamic brake. For this calculation, locomotives with 3,800 HP or more are considered as having high-capacity dynamic brake. These 6-axle locomotive count as 8 axles, and 4-axle locomotive count as 6 axles.

For example, a train with 6,000 total trailing tons powered by two 3,000 HP, 6-axle locomotive and one 3,800 HP, 6-axle locomotive has 300 tons per dynamic brake axle (6,000 tons divided by 20 axles;  $6+6+8=20$  axles). When making the calculation, include in the gross trailing tonnage the weight of any locomotive, including a helper locomotive, not operating in dynamic brake or with dynamic brake cut out.

**Tons per Operative Brake** - The gross trailing tonnage of the train divided by the total number of cars having operative brakes. For example, a 100-car train with all brakes operating, having a total train weight of 6,000 tons, has 60 tons per operative brake (6,000 tons divided by 100 cars).

Train lists showing average tons per car or platform will equal tons per operative brake when the train list is current (no additional pickups or setouts have been made), no brakes have been cut out or there is one brake per car or platform (this is not the condition for some equipment, such as articulated intermodal cars).

**Track-Train Dynamics** - A general term used to describe the interaction of a locomotive and cars with the track structure during the movement of a train. Track-train dynamics are affected by variables such as weather, speed, train make-up, train handling, condition of track and equipment, grade, curvature and operating policies.

**Transfer Train Movement** - A movement of an engine and one or more cars, without intermediate switching, of at least 1 mile, but not more than 20 miles between a yard and another carrier's interchange or between two interchanges.

**Unattended** - Equipment is unattended when an employee is not in a position to immediately control the brake system.

**Unit Train** - A train made up entirely of cars used to transport coal, grain, ore, potash, molten sulfur, soda ash, phosphate rock, oil, taconite or other bulk commodities.

**Vent Valve** - A valve attached to the brake system of a car or locomotive. The valve responds to an emergency brake pipe pressure rate of reduction by venting the brake pipe at each vehicle to the atmosphere. As a result, the emergency application spreads throughout the train.

**Wheel Sliding** - When the wheel rotates slower than lengthwise movement dictates.

**Wheel Slipping** - When the wheel rotates faster than lengthwise movement dictates.

**Yard Test Plant** - A system of piping and fittings that supplies air at convenient locations to charge and to test cars without a locomotive.

**Yard Train Movement** - A movement of an engine and one or more cars, without intermediate switching, of at least 1 mile, but not more than 20 miles between two yards, between a yard and an industrial area or between two industrial areas of the same carrier.



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## Safety Rules

## **70 GENERAL SAFETY INSTRUCTIONS**

### **70.1 *Safety Responsibilities***

Employees must:

- Be responsible for their personal safety and accountable for their behavior as a condition of employment.
- Take every precaution to prevent injury to themselves, other employees and the public.
- Comply with all rules, policies and outstanding instructions.
- Report, correct or protect any unsafe condition or practice.
- Be aware of and work within the limits of their physical capabilities and not use excessive force to accomplish tasks.
- Use good judgment in fulfilling job responsibilities safely.

Past practices that do not conform to the rules are unacceptable.

### **70.2 *System Safety Policies***

Several safety rules refer to policies contained in company publications such as the *Employee Safety Handbook*. Other company or departmental policies are also in effect. Employees must be trained and be conversant with applicable policies and procedures related to their duties and be governed by them. This information is available to all employees through their local manager.

Refer to Railroad Operating Rule 1.13 (Reporting and Complying with Instructions).

### **70.3 *Job Safety Briefing (JSA)***

Use the Job Safety Briefing process:

- 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. Refer to Railroad Operating Rule 1.4 (Good Faith Challenge) for guidance when discussing alternatives.

Each work plan must consider hazards, assign specific responsibilities and explain those assignments.

**Plan the Job Safety Briefing:**

- A. Develop your own work plan.
- B. Use a Job Safety Briefing check list when applicable. Complete and sign the check list as required.
- C. Consider existing and potential hazards that might be involved as a result of:
  - Job and weather.
  - The nature of the work to be done.
  - The job location.
  - The tools, equipment and materials used.
  - Safety or personal protective equipment required.
- D. When making work assignments, consider:
  - Abilities and experience of each individual.
  - Group assignments and/or individual assignment.

**Conduct the Job Safety Briefing:**

- A. Discuss existing or potential hazards and ways to eliminate or protect against them.
- B. Make definite work assignments and make sure each employee understands their assignment.

- C. If special tools, materials, equipment or methods are to be used, make sure each employee knows how to proceed safely.
- D. Issue all instructions clearly and concisely and check to see that they are understood.
- E. For complex jobs:
  - Divide the work into segments and brief only on each segment of the job.
  - As each segment is completed, stop and conduct additional briefings before the job progresses.
- F. Upon completion of the Job Safety Briefing, each employee in attendance must sign the Job Safety Analysis (JSA) form, acknowledging they participated in the briefing and have a full understanding of all matters discussed.

## **70.4 Safe Working Space**

Allow for ample spacing between work groups when working in groups. Be aware of the work and movement of other group members and equipment. Warn other group(s) when a conflict appears imminent.

## **70.5 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, pinched or crushed.

### **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 lockout/tag out procedures followed.

Refer to the *Employee Safety Handbook, Hazardous Energy Control*.

## **70.6 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.

## **70.7 Building Safety**

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

### **70.7.1 Filing Cabinets**

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

### **70.7.2 Drawers**

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

### **70.7.3 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.

### **70.7.4 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.

### **70.7.5 Cords**

Permanent installations of telephone or other electrical cords that are in walking areas must be encased. Action must be taken to protect temporary installations.

### **70.7.6 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.

## **70.8 *Motioning Vehicles at Grade Crossings***

Do not motion vehicles to proceed over grade crossings unless all rail movement is stopped, and a crew member occupies a prominent position at the edge of the crossing to be seen by vehicular traffic.

## **70.9 *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. Your supervisor must be advised of all unauthorized persons or trespassers on company property.

## **70.10 *Criminal Activity***

Immediately contact local law enforcement authorities 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.

## **70.11 *Housekeeping***

Good housekeeping must be maintained at all times. Dispose of garbage, water bottles, used batteries, or other refuse material (such as sunflower 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.

## **70.12 *Protruding Nails***

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

## **70.13 *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.

## **70.14 Warning Signs**

Label damaged or defective machines, switches, valves or other apparatus with a danger sign, tag, or banner. Danger signs must be placed at locations where there are exposed energized circuits. 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.

## **70.15 Compressed Air/Gas**

Use of compressed air or any gas to blow dust or dirt from the body or clothing is prohibited. An air nozzle must not be placed against any portion of the body. Compressed air must not be used for cleaning purposes in shop areas, unless the hose nozzle is of the type which will reduce the pressure to 30PSI less at the main opening when dead-ended or obstructed.

Inhaling purposely any type of compressed gas not specifically designated for inhalation is prohibited.

## **70.16 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.

## **70.17 Rail Under Tension**

Close observation must be made to determine whether rail is too tight to safely perform work:

- At a point where there has been a derailment.
- In periods of high temperature.
- At a location where rail is kinked or damaged.
- Before beginning to renew rail or to remove part of fastenings from one or more rails.

## **70.18 Use of Fuses**

Fuses must be stored:

- In approved containers in motor vehicles and other designated equipment.

- In flagging kits or racks in engines.
- In the original shipping container in a storage cabinet.

Fusees must be:

- Used for signaling purposes only.
- Placed by hand (except fusees may be dropped off moving trains in emergencies or under flagging conditions).
- Kept away from high temperatures, fire or open flame.

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, and must be disposed of properly.

To the greatest extent practical, they must be kept where they cannot be obtained by unauthorized persons.

## **70.19 Lighting Fusees**

When lighting Fusees:

- Hold the end to be lighted down and away from your body.
- Strike 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.

## **70.20 Reserved**

## **70.21 Air Contaminants**

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



Do not enter a suspected or confirmed contaminated area without following prescribed procedures and using required personal protective equipment.

### **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.

## **70.22 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.

## **70.23 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.

## **70.24 Hazard Communication Standard**

The Hazard Communication Standard (HCS) was developed by the Occupational Safety and Health Administration (OSHA) to inform employees of the hazards associated with certain chemical substances. 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. Only chemicals, paints, compounds or other products approved by the company will be used. Before handling containers or using chemicals substances, employees must be aware of the contents and any hazardous conditions that may exist. They must take all necessary precautions to ensure the safety of themselves and others, and must wear approved protective equipment that may be required.

## **70.25 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 bungholes 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.

## **70.26 Working with Refrigeration Systems**

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

# **71 PERSONAL PROTECTIVE EQUIPMENT**

## **71.1 General Guidelines**

Only personal protective equipment (PPE) approved by the Safety Department will be used while on duty and only for the purpose intended. 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.

### **Altering Personal Protective Equipment**

Do not alter or use altered PPE.

## 71.2 **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. Approved hearing protection devices are made available at the work site where their use is designated. In some cases, wearing dual protection devices is required, which consist of earplugs plus muffs.

### 71.2.1 **Hearing Protection - 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 open-sided or enclosed system car and locomotive shop buildings.

**EXCEPTION: Persons in low noise areas, identified by Safety Department, are not required to wear hearing protection.**

2. **Car Repair or Service Track Building:** When working in open-sided or enclosed areas where cars are repaired, or locomotives are fueled or serviced.

**EXCEPTION: 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.

### 71.2.2 **Hearing Protection - Locomotives**

1. **Engine Room or Air Compressor Doors Open:** Hearing protection is required on a running locomotive when any engine room or air compressor door is open.
2. **On or Around Operating Locomotive:** Hearing protection is required when on or within 100 feet of an operating locomotive.

### 71.2.3 **Hearing Protection - Roadway or Work Equipment**

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

### 71.2.4 **Hearing Protection - 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, electrically, hydraulic, pneumatic or steam.

### **71.3 Hand Protection/Gloves**

Use appropriate hand protection when hands are exposed to:

- Skin absorption of harmful substances.
- Cuts, lacerations or abrasions.
- Punctures.
- Chemicals.
- Temperature extremes.

### **71.4 Hard Hats**

Hard hats must be worn in work sites and in other designated hard hat areas as specified by department heads.

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 is prohibited. Hard hats must not be worn backwards, unless attachments being used are designed for such use and suspension is reversed.

Bump caps will not be used to fulfill hard hat requirements.

## **71.5 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 lunchrooms.
- Enclosed vehicles.

### **71.5.1 Areas that Require Eye Protection**

**Safety Glasses:** Wear spectacle-type, 100-percent safety glasses with side shields when on duty at locomotive or car repair 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 glasses.

**Other Glasses:** As designated by the Safety Department, train, engine, yard, and all other personnel on company property and on duty must wear glasses (FDA approved or ANSI W87.1 approved). They must be spectacle-type glasses that cover the entire eye area (no half glasses or granny glasses).

### **71.5.2 Additional Eye Protection**

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

- Handling acids and caustics: splash goggles with face shield.
- Fueling locomotives: splash goggles or face shield with safety glasses.
- Using pedestal or disc grinder: dust goggles or face shield with safety glasses.
- Grinding or cutting rail or other track components: face shield with goggles.

- Using or observing electric arc welding: proper helmet with proper lens shade.
- Using or observing oxy/fuel cutting or heating operations: goggles or face shield with proper lens shade.
- Dusty environments created by use of impact tools, hammering, sanding locomotives or in windy conditions: dust goggles.
- Using powered by explosives: dust goggles or face shield with safety glasses.
- Using chain saw: dust goggles or face shield with safety glasses.
- Jump-starting batteries with booster cables: safety glasses.

### **71.5.3 Contact Lenses**

Do not wear contact lenses when working in areas where wind, dust and other foreign matter constitute a hazard or when chemicals may cause a splash, mist or vapor hazard.

### **71.5.4 Dark Lenses**

The wearing of dark lenses under insufficient lighting conditions is prohibited, except when engaged in an operation requiring dark lenses.

## **71.6 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, neckties, finger rings or other jewelry while operating or working with machinery. Hair, including beards, must be worn in a manner to permit safe performance of duties.

Wear a suitable shirt that provides protection from sun, insects, abrasions, or scratches. 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 shirttails 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.

## 71.7 Footwear

Footwear is an important factor when developing good working habits. Wear only those boots or shoes designated for the type of work you are performing. Make sure that the soles and heels are firmly attached and that the heels are not excessively worn over.

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 or high-heeled shoes, sandals, athletic (sports) shoes or similar footwear.

### 71.7.1 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. However, approved snowpack’s are acceptable.

### 71.7.2 Covers the Ankle

Footwear that covers the ankle will be a boot (either slip on or lace up) of approximately 6 inches or more in height. Employees who routinely work in the field must wear footwear that covers their ankles. **Lace-up boots are required for Transportation, Car Department , and Engineering employees.** Intermodal employees that load and unload trailers/containers are required to wear 6-inch lace-up steel-toed footwear that meets OSHA Requirements.

### 71.7.3 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.

- Locomotive.
- Car.
- Supply.
- Construction
- Telecommunications.

#### **71.7.4 FRA Required Footwear**

Bridge workers are required to wear safety footwear that conforms to FRA footwear requirements.

#### **71.7.5 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.

### **71.8 Respirators**

When conditions require wearing a respirator, you must receive a proper fit test and instructions, including demonstrations and practice on how the respirator should be worn, how to adjust it and how to determine if it fits properly. Respirators must provide a good face seal. Respirator users must not have facial hair that protrudes under the respirator seal or interferes with respirator valve functions.

## **72 FIRE PREVENTION**

### **72.1 Sounding Alarm**

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

### **72.2 Operating Fire Equipment**

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

### **72.3 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.

## **72.4 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.

## **72.5 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.

## **72.6 Questionable Fire Hazards**

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

## **72.7 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.

### **72.7.1 Fixed Facilities**

Extinguishers must be visually inspected monthly and subjected to an annual maintenance check by a qualified person. A qualified person will make a monthly 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.

### **72.7.2 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.

## **72.8 Fire Classifications**

The five 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, grease and gases). Extinguish with ordinary or multipurpose dry chemical, Halon 1211, or carbon dioxide are 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.

**Class K** - Fires in cooking oils and greases such as animal fats and vegetable fats. Use a wet chemical extinguisher rated for Class K fires (extinguishes the fire by removing the heat of the fire triangle and prevents re-ignition by creating a barrier between the oxygen and fuel elements).

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

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

## **72.9 Right-of-Way Fires**

Crew members must promptly report to the proper authority fires on or near the right-of-way unless the fire is being controlled. If the fire may spread to a bridge or other structure, train must stop and crew members help extinguish the fire.

When employees know that a train has started a fire, they must promptly notify the proper authority and, if possible, the engineer. All other known fire causes should be reported to the proper authority.

## **72.10 Starting Fires**

Flammable liquid must not be used to start or intensify a fire.

## **72.11 Open Burning Prohibited**

Burning of any kind (i.e. ties, trash, for warming, etc.) is *not* allowed without written approval from the proper authority. Approval will not be granted until the employee obtains the necessary environmental and fire permits from state and local authorities. Compliance with all fire permit provisions is essential. A fire permit alone will not be sufficient. A fire must be attended until it is completely out.

## **72.12 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.

## **72.13 Use and Handling of Liquefied Petroleum Gas (LPG)**

Units powered by LPG must not be subjected to extreme heat in areas near ovens, furnaces or other sources of high temperature.

At the end of the day's operation, valves on tanks of LPG-powered equipment must be turned off to prevent leakage and potential explosion.

## **72.14 Flammable and Combustible Liquids Storage**

Flammable liquids (including paints) and combustibles, must be stored in approved cabinets or designated areas and in approved and 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.

### **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.”

## **72.15 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.

## **72.16 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.

## **72.17 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. Use only safety approved gas cans.

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.

#### **72.17.1 Fueling Portable Power Equipment**

When fueling is necessary during use, the engine must be stopped and sufficient time allowed for engine to cool. Tools 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.

#### **72.17.2 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 outdoors, 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.

### ***72.18 Buildings or Equipment***

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

### ***72.19 Open Flame Starting***

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

### ***72.20 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.

### ***72.21 Water Flash Back Protection***

Water flash back protection device must be filled to the required level with water each week. Flash back water seals on hydraulic back pressure valves located on permanent lines through shops must be inspected at least once each week and water kept at proper level. Water seals of hydraulic backpressure valves must be

tagged to show date inspected. Inspect back flow-check valve outlets at all stations on a weekly basis to determine that they will properly function.

## **73 Reserved**

## **74 VEHICLES/BATTERIES**

### **74.1 *Vehicle Maintenance***

The 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.

### **74.2 *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.

#### **DOT Qualified Drivers**

Drivers of company vehicles that meet one or more of the following criteria will be required to pass knowledge and skills (driving) tests 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 10,000 pounds or more must be qualified and familiar with Federal Motor Carriers Safety Regulations, which require that drivers have the following on file at company headquarters:

- Photocopy of Medical Examiner's Certificate.
- Photocopy of Road Test Certificate for DOT certified drivers who do not possess a CDL license.
- Photocopy of Driver's Operator license.
- Photocopy of Waiver of Physical Disqualification, if applicable.
- Photocopy of Driver's Application for Employment, if the application must be completed and included a prior driving record (if not a new application, must be complete and included in the operator's DOT file).
- Photocopy of Annual Review of Driving Record (required every 12 months).

### **74.3 Driver Responsibility**

Drivers must:

- Know and observe all local, state, and federal laws and regulations governing vehicle operation.
- Use courtesy, consideration, and common sense 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 condition necessitates operating at a lower speed.
- Ensure that required emergency equipment and tools are on the vehicle.

### **74.4 Impaired Driver**

Do not drive when suffering fatigue, illness, lack of sleep or any other physical condition, which may affect alertness and ability to operate the vehicle safely.

### **74.5 Tools and Material**

Good housekeeping must be maintained in the vehicle at all times. Loose items must not be kept on the dash or 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.

## **74.6 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.

## **74.7 Passengers**

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

## **74.8 Seat Belts**

All vehicle occupants must use seat belts, where provided. This includes Company vehicles, privately-owned vehicles used on Company business, leased, rented or contract vehicles, and hi-rail vehicles on and off the rail. 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.).

**Exception: Seat belt use is not required if vehicle is not exceeding 5 mph and vehicle is used during the task of inspecting cars, coupling air hoses or changing brake shoes. Site specific instructions will supersede this exception.**

## **74.9 Seating and Transporting**

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.

## **74.10 Headlights On**

Vehicle headlights will be illuminated while vehicles are in operation.



## **74.11 Back-Up Moves**

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 look in the direction of movement.

When a driver is backing up and rearward vision is impaired, a second individual, when available, must be near the rear of the vehicle and guide the vehicle to protect the movement.

## **74.12 Railroad Grade Crossing**

Drivers must approach railroad crossings prepared to stop. Vehicles designed to transport 16 or more passengers (including the driver) or placarded vehicles must stop at all highway railroad crossings at grade.

When crossing tracks in train yards, and visibility is blocked by railroad cars or locomotives, the driver of the vehicle must:

- Use alternate crossing.
- or
- Stop the vehicle and verify (by either a flagman or personal observation) that there will be no movement on the tracks being crossed.

Drivers of vehicles transporting train, engine and yard employees must stop and look both ways before proceeding over any crossing in a train yard.

## **74.13 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. This requirement does not apply to transporting railroad flagging kits. 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.

When vehicles are required to transport flagging kits, a copy of the DOT Exemption 7991 must be in the vehicle.

When transporting hazardous material, the responsible employee must obtain and have in his/her possession a copy of the proper shipping paper.

## **74.14 Parked Vehicle**

If necessary to leave the vehicle motor running, the parking brake must be firmly set and the transmission placed in neutral (manual transmissions) or park (automatic transmissions) to prevent movement.

When vehicles are parked and left unattended, standard transmissions must be placed in low gear, automatic transmissions in park, emergency brake set and the motor stopped.

Ignition key must be removed, windows closed and doors locked. In addition, when vehicles or trailers are parked on a grade, precautions must be taken to ensure they cannot roll unexpectedly.

## **74.15 Towing 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.

## **74.16 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.

## **74.17 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 road ways.

Riders shall not be permitted on vehicles unless provided with a seat. Riding sidesaddle on yard vehicles is prohibited. Vehicles designed for one person must not be occupied by more than one person. Where provided, seat belts will be worn.

Do not adjust or disable any speed limiting device.

## **74.18 Battery Inspection**

Inspect batteries as required.

## **74.19 Charging 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 charge, disconnect the negative post first and 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 and showers must be located at or near permanent battery charging installations and must be checked at least once every thirty days. 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 fully charged condition.

## **74.20 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. Jump start shunted machines on-track from a non-rail source.
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. 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.
7. Connect one end of the second cable [negative (-)] to other [negative (-)] of good battery. Make final connection on engine block of stalled engine (not to negative post) away from battery, carburetor, fuel line, any tubing or moving parts.
8. Stand back from both vehicles. Start vehicle with good battery – then start the disabled vehicle.
9. Remove cables in reverse order of connections beginning by first removing cable from engine block or metallic ground.

# **75 MATERIAL HANDLING**

## **75.1 Lifting and Moving Material**

Each person is responsible for determining their own 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 jerking motions.
- Lift with legs and not the muscles in your back
- Do not lift and twist at the same time.
- Avoid lifting from the floor when possible. Lifting from shelves or platforms is preferable when possible.

#### **75.1.1 Steps to Safe Lifting**

Observe the following steps when lifting any items:

1. Check the load 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. Inspect the lift areas for a clear lift, preferably at knuckle height, without reaching
4. Choose the right lifting technique (e.g. squat, semi-stoop or balanced one-hand lift).

#### **75.1.2 Lifting with Two or More Employees**

Conduct a job briefing before planning 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 backward.

## **75.2 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, 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.

### **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 near the stacking operation.

## **75.3 Moving Materials**

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

## **75.4 Other Protruding Objects**

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

## **75.5 Transfer Plates and Loading Ramps**

When working with transfer plates, loading ramps, gang planks or skids:

- Ensure that they are strong enough for the load.
- Properly place and secure devices before using.
- When placing them between a car and platform, lower them by hand or slide them into position unless using a lift truck.
- When lifting or placing transfer plates, prevent the plate from slipping or falling and keep hands and feet clear of the plates.
- When removing gang planks, transfer plates or skids remove nails, cleats or other fastening devices and dispose of properly.

## **75.6 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.

## **75.7 Loading and Unloading Truck Trailers**

Do not load or unload a truck trailer while the tractor is being coupled or uncoupled or when a tractor is coupled and the engine is running, unless necessary to operate attached boom/hoisting equipment.

The brakes of highway trucks must be set and wheel cocks placed under the rear wheels to prevent trucks from rolling while they are boarded with powered industrial trucks.

- If present, trailer to dock locking devices must be used and checked to see that the lock is securely attached to the trailer before proceeding to unload.

- If trailer to dock locking devices are not present, the rear wheels of the trailer must be chocked on both sides of the trailer by placing approved wheel cocks securely against the tires. Only those wheel cocks designed and manufactured for this specific purpose should be used, and then only those with gripping surface. Make-shift chocks must not be used.
- Trailers that have been spotted and the tractor has been disconnected must have an approved trailer stabilizing jack placed underneath the nose and directly in the center of the trailer. If the load appears to be exceptionally heavy, has shifted to one side, or in the event there could be a possible defect with the landing gear, it will be necessary to place a jack under both front corners of the trailer.
- Trailers with tractor attached require the locking device or the rear wheels chocked and ensure the brakes are set.
- Visually inspect the floor of trailers prior to entry with fork truck. Any defects detected must be reported to immediate supervisor. **Do not exceed the capacity of the floor.**

## **75.8 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. Ratchet action load binders are the preferred alternative. All binders must be inspected and in good condition for use.

## **75.9 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 move by kicking or rolling on their sides.
- Do not attempt to up-end a filled drum without assistance or mechanical equipment.



## **75.10 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.

## **75.11 Use of Forklifts**

### **75.11.1 Training**

Only qualified operators may use a forklift.

### **75.11.2 Inspection**

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

### **75.11.3 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.
- A 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, against mast. 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 forklifts clear of edge of loading docks, platforms and gang boards.
- 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 can 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.
- Operators must comply with OSHA 1910.178 standard.

#### **75.11.4 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 railroad tracks.
6. Do not park on inclines.

#### **75.11.5 Reserved**

## **76 TOOLS AND MACHINERY**

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

### **GENERAL**

#### **76.1 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 unless approved through departmental procedures. Unauthorized use of tools, equipment and machinery is prohibited.

## **76.2 *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.
- 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, etc.).
- Do not carry a power tool by the cord, and do not unplug a power tool by jerking on the cord.

Chip protectors must be used on track chisels, drift pins or similar struck tools.

## **76.3 *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.

## **76.4 *Assigned Places***

Keep tools, materials and supplies in assigned places. Tools and equipment must be returned to storage position when work has been completed. Tools, equipment and materials must be safely and neatly arranged in storage areas, tool bins or designated locations. Hoses and extension cords must be arranged so they will not be a tripping hazard.

## **76.5 *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, rags or among tools in drawers or toolboxes).

## **76.6 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.

## **76.7 Chuck Wrenches**

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

# **HAND TOOLS**

## **76.8 Purpose of Tools**

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.

## **76.9 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.

## **76.10 Hammers**

Hammers must be used only for their intended purpose.

Type	Intended Use
Claw	For use on soft steel, such as nails. Nails or spikes must be well started before a full blow is struck.
Ball Peen	For use on hard metal, such as a chisel.

Engine	For emergency use by operating employees.
Sledge	For use on hardened steel.
Rubber Mallet	For use on hard metals.
Soft Metal Hammers (i.e. brass, aluminum, copper, etc.)	Special application to prevent damage, such as striking reamers, taps, drills, cutters or other hardened steel tools.

## **76.11 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.

## **76.12 Hand Adze**

Remove nails, dirt, stones and other debris from the item to be adzed. 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.

## **76.13 Sharp Edged Tools**

Use the proper tool for the job.

<b>Tool</b>	<b>Intended Use and/or Special Instructions</b>
Wire Stripper	Used to cut wire. Hold the short end of the wire to reduce the danger of flying bits. Always cut at right angle. Cutters are dulled by rocking from side to side or bending the wire back and forth against the cutting blade.
Compound Leverage Cutter/Bolt Cutters	Used to cut chain, bolts or heavy gauge wire.
PVC/Hose Cutter	Use for cutting PVC pipe or any hoses, especially oxy-acetylene hoses.
Banding Cutters	Used to cut bands.

Utility Knives	Safer than hooked or pocket knives for opening cartons. They not only protect the user, but also eliminate deep cuts that could damage the carton contents.
Pocket Knives	Use knives designed with a locked blade no longer than 3 inches in length. Knives must not be used as a substitute for can openers, screwdrivers, ice picks or other tools designed for cutting various material.
Chisel	Mushroomed or damaged chisels must be redressed or destroyed.

The use of pocket knives for cutting or removing gaskets is prohibited. Use chemical gasket remover where possible to soften the old gasket and then use a scraper or putty knife to remove the gasket. A gasket grinder may also be used to remove old gaskets. Use a retractable blade utility knife to cut new gaskets. Use clamps to hold down both the template and the gasket material.

When using tools such as knives, chisels and screwdrivers, 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 position that place them clear of the blade stroke. Protective clothing should be worn.

### **76.14 Use of 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.

### **76.15 Banding Tools**

Use caution when handling banding materials and tools. When applying banding, have a firm grip on the banding tool 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.

### **76.16 Use of Files**

Files must be cleaned by using a wire brush and not by striking against a vise or another metal object. They must not be hammered or used as pry, punch chisel or

any other type of tool. Files must have wooden or plastic handles attached.

## **76.17 Carrying Tools**

Long handled tools must not be carried in such a manner that will present a hazard to yourself or others. Carrying file, ice pick or other pointed tools, unless point is protected, is prohibited.

## **76.18 Bars and Levers**

Do not sit, stand on or straddle a bar or lever.

Place bars, levers or tools properly and while using them:

- 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.

## **76.19 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.

## **76.20 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 fulcrum to multiply your force on the tie.

## **76.21 Rail Turners**

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

rail. **Do not use a lining bar to turn rail.**

## **76.22 Track Jack**

Track jack must be inspected before using for:

- Cracked 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. Jacks must be inspected monthly, and before each use.

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. Do not walk track jack down.

Mechanical track jack or step jack must not be used by the Locomotive and Car Departments.

## **76.23 Other Jacks**

Only approved jacks will be used to lift cars or locomotives. When necessary to jack a locomotive, car or other heavy equipment to remove trucks, wheels, couplers, etc., it must be determined that the jacks are of sufficient capacity:

Follow these precautions when using jacks:

- Ensure that sufficient footing exists.
- Use sufficient-sized blocking under the jack.
- Ensure that the jack is properly placed and level.
- 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. Special rubber pads may be used with stationary jacks.

- Fully insert the handle into the jack socket. Remove it from the socket after completing the operation.
- When in the process of jacking, do not crawl or place any part of your body under the load or in the line of applied force.
- Block or crib your load incrementally as it is lifted. Position yourself in a manner that will keep you clear of the load, and will not allow your hands between the load and cribbing.

## **76.24 Blocks Under Jacked Equipment**

Follow these precautions when jacking up equipment:

1. Chock the wheels, to prevent movement, before jacking up the end of the car, locomotive, locomotive crane, etc. On stationary floor jacks, wheel blocking shall be placed immediately after the lift before other work commences.
2. After jacking, place the stand or blocks under the load where there is sufficient strength to support the car, locomotive, locomotive crane, etc.
3. Lower load until a portion of it rests on the stands or blocks. If self-locking mechanism or load-holding rings are used, additional blocking is not required.
4. Do not work on or go under equipment that is not protected by stands, blocks, load rings or positive locking.
5. When trucks are under car, use the proper tool to remove or position the center pin.

## **76.25 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 objects fails.
- Make sure the wrench is pulled toward the body, whenever possible.

## **76.26 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**

## **76.27 Authorized Employees**

Only authorized employees are permitted to operate portable power tools.

## **76.28 Dispensing Fuel**

When dispensing fuel, observe the following requirements:

- Do not smoke or light a fire in the vicinity.
- Turn off all engines before fueling.
- Maintain contact between the side of the fuel tank and the fuel nozzle to prevent a static discharge. Only use approved fuel cans equipped with a standard pouring nozzle.
- Be careful not to spill fuel. Report spills promptly to the proper authority.
- If additional lighting is necessary, use only approved flashlights or electric lanterns.
- Do not use cell while fueling or refueling.

## **76.29 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. Whip checks or hoses equipped with check valves in both ends must be used. Wire must not be used in air or hydraulic couplings in place of clip pins.

## **76.30 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.

## **76.31 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.

### **76.32 Impact Wrenches**

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

### **76.33 Huck Guns**

Huck guns and all hydraulic two-piece rivet guns must be held perpendicular to the surface to which the bolt is being applied. Hands and fingers must not be placed between the huck tools and/or parts being fastened as the tool tightens the collar.

### **76.34 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.

### **76.35 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.

### **76.36 Chain Saw**

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

- Dust goggles or face shield with safety glasses.
- Gloves.
- Long-sleeved shirt.
- 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.

### **76.37 Weed/Brush Cutting**

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

## **FIXED MACHINERY/PORTABLE EQUIPMENT**

### **76.38 Authorized Employees**

Only authorized employees are permitted to operate machinery or equipment.

### **76.39 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. Follow environmental guidelines to dispose of waste products.

### **76.40 Left Unattended**

Do not leave running machines unattended.

### **76.41 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.

### **76.42 Woodworking Machines**

Exercise caution when operating woodworking machines:

- Stand to one side and not directly behind 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. Provide an adjustable stop to prevent the

forward travel of the blade beyond the position necessary to complete the cut in repetitive operations.

- 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.

### **76.43 Clamping Material**

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

### **76.44 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.

### **76.45 Pedestal or Bench Mounted Abrasive Grinders**

#### **76.45.1 Mounting**

Prior to mounting, all wheels must be inspected for damage and cracks. Wheels that show any evidence of cracks, abusive handling or storage, must 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.

### **76.45.2 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.

### **76.45.3 Using Grinders**

When using grinder:

- Prior to doing any work with the grinder, it must be run for one minute. During this period, the operator must check the machine 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 side 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.

### ***76.46 Anvils, Dies and Trip Hammers***

Do not use your hands to place blocks, tools or other material on anvils, dies or trip hammers.

## **77 MECHANICAL LIFTING AND PULLING OPERATIONS**

### ***77.1 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.

### ***77.2 Inspection***

All hoisting equipment and rigging must be inspected daily before use and periodically as required. If defects are found, they must be corrected or equipment must be removed from service. Maintain a record of inspections on equipment and have records available upon request.

### ***77.3 Safe Load***

Do not overload hoisting and rigging equipment.

Do not side-load or drag a load with hoisting equipment.

Raise or 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.

## **77.4 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 safeguarding all machine movements. Before signaling boom or machine movement, the ground man must see that the load, cab and boom will not come in contact with nearby wires, structures or other objects and persons. When required to move cars or on-track equipment, the ground man must be qualified on the use of their braking systems.

## **77.5 Crane Operator**

Crane operators must be qualified on the equipment they will operate.

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.

## **77.6 Crane 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:

### **77.6.1 Crane Hand Signals**

The person giving signals must:

- Be qualified to give signals to crane operators.
- 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.

### **77.6.2 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 RIGHT.  
 SWING LEFT.  
 EXTEND OUT.  
 RETRACT IN.  
 STOP.

If audio communication is lost or becomes inaudible, the crane operator must stop all crane movement immediately.

## ***77.7 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.

## ***77.8 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.

- Ground personnel must barricade or delineate the lift zone and only allow authorized individuals inside the lift zone.

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.

## **77.9 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.

## **77.10 Operations 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 car.

## **77.11 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 necessary, and then only after notifying operator. Where necessary, use tag lines or 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.

## **77.12 Avoiding Falls**

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

## **77.13 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 attachment fail. Protect yourself from possible whipping or recoil action should the device release suddenly.

## **MOBILE CRANES**

### **77.14 Safe Load Chart**

Equipment for lifting, hoisting or handling material must have a load chart posted where it is visible to the crane operator. The chart 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 charted load capacities.**

### **77.15 Boom Inspection**

Booms must be lowered for inspection, lubrication and repairs

### **77.16 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**

### **77.17 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.

## **77.18 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 others along the load path.

### **WIRE ROPE**

## **77.19 Wire Rope**

### **77.19.1 Wire Rope Working Loads**

Different sizes of wire ropes are used as suspension cables, boom cables, guy cables, hoisting and other devices. Determine the safe working load for each size of wire rope by comparing the current manufacturer's specifications of working load strength to the wire rope's diameter and the design and materials used in the rope construction.

### **77.19.2 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, and before each use. 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.
- Several 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 unstringing.

### **77.19.3 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 valley between strands.

#### 77.19.4 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 seizing on each side of the spot where the wire rope will be cut to prevent the strands from unlaying. Place the seizing as follows:
  - On performed wire rope, place one seizing on each side of the cut.
  - On non-performed wire ropes of 7/8-inch diameter or smaller, place two seizing on each side of the cut.
  - On non-performed wire ropes 1 inch or larger, place three seizing 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.

#### 77.19.5 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 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.

#### 77.19.6 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.

### **77.19.7 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. “Never saddle a dead horse.”

## **RIGGING**

### **77.20 Use of 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.

### **77.21 Use of Fittings**

#### **77.21.1 Fitting Inspection**

Fittings shall be inspected:

- Upon purchase.
- Prior to each use.

#### **77.21.2 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 caused 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.

### **77.21.3 Hooks and Attachments**

Non-alloyed carbon-steel hooks, repair links or other attachments must not be used. Homemade or makeshift bolts, rods, shackles, hooks or other attachments must not be used unless approved through departmental procedures. 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. Hooks purchased after Sept. 30, 1991 require a dated record of proof load testing.

## **77.22 Wire Rope Slings**

### **77.22.1 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.

### **77.22.2 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 abrasions 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.

## **77.23 Chain Slings and Chain**

### **77.23.1 Chain Inspection/Replacement**

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

- Wear, nicks, cracks, breaks, gouges, bends and weld splatter.
- Elongation: must not exceed 15%.
- Discoloration from excessive temperature and throat opening of hooks.
- Chain links and attachment 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.

### 77.23.2 Chain Working Loads

Grade 80 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.

Determine the safe working loads for all lifting chains by referring to the current manufacturer's specifications of working load strengths versus chain size. If the manufacturer's information is not available, follow the limits in the table below:

<b>GRADE 80 ALLOY CHAIN</b>	
Size (Inches)	Maximum Load (Lbs.)
9/32	3,500
3/8	7,100
1/2	12,000
5/8	18,100
3/4	28,300
7/8	34,200
1	47,700
1-1/4	72,300

Grade 70 chain will not be used for any applications.

### 77.23.3 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.

### 77.23.4 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.

### **77.23.5 Chain Lubrication**

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.

## **77.24 Synthetic Slings**

### **77.24.1 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.

### **77.24.2 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 pitting, 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.

## **77.25 Webbing and Round Slings**

All 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 that exposes the core fibers.

## **77.26 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 bolt increases. As the eyebolt becomes side loaded, the eyebolt loses strength. Select the proper size swivel hoist ring to allow 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.

## **77.27 Inspecting Ropes**

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

# **78 ELECTRICAL**

## **78.1 Authorized Employees**

Only authorized employees are permitted to:

- Work on electrical apparatus of equipment.
- Climb poles and replace fuses on power poles or work on transformers.
- Work on line or equipment energized in excess of 50 volts phase to ground.

## **78.2 *Electrical Cords***

Inspect electrical cords and make sure they are in good condition and have a common 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 intentionally overload electrical circuits.

The use of a ground fault circuit interrupter (GFCI) is required for use in any work environment that is or may become wet and any other areas that are highly grounded, such as a work area with a metal floor.

## **78.3 *Electrical Panels***

In shop areas, the floor area in front of electrical control boxes must be kept clear of any obstruction. The cleared surface must be painted red with a white border to extend a minimum of 36 inches forward of the control box and minimum of 36 inches wide, or the width of the box, whichever is greater, and stenciled with wording “KEEP CLEAR”, or “KEEP CLEAR AT ALL TIMES”.

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

## **78.4 *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.

## **78.5 *Shorting Electrical Circuits***

Use only approved nonmetallic 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.

## **78.6 *Working Near Power Lines***

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 near power lines, Rule 78.7 (Booms Near Power Lines) applies.

**Table E**  
**NEC Approach Boundaries for Unqualified Employees From Live Equipment**

<b>Voltage Range (line to line)</b>	<b>Approach boundary from Live Fixed Equipment</b>	<b>Approach Boundary from Live Movable Conductors</b>
50 to not over 750 V	4 ft. 0 in. (1.22 m)	10 ft. 0 in. (3.04 m)
over 750 V, not over 15 kV	5 ft. 0 in. (1.52 m)	10 ft. 0 in. (3.04 m)

Note: For voltage over 50,000 volts, add ½ inch for each KV (1,000 volts).

### **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.

## **78.7 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.

If proper clearance cannot be maintained, shut off the power and ground power lines before performing work.

### **78.7.1 Proper Clearances**

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

- Lines rated 50KV (50,000 volts) or less, minimum clearance between the line and any part of the crane or load must be 10 feet.
- Lines rated over 50 KV (50,00 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.

### **78.7.2 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.

## **78.8 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 begin 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.

## **78.9 Handling Electrical Wires**

Immediately report electrical wire 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.

## **78.10 Lockout/Tagout**

Perform a lockout/tagout ( in compliance with TGS standards) on 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.

## 79 WELDING

### CUTTING, WELDING OR HEATING

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

#### 79.1 *Authorized Employees*

Only authorized 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.

#### 79.2 *Protective Equipment*

##### 79.2.1 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 flames unless properly protected and must warn others against looking at the arc or flames.

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

Welding Operation	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-ferrous) – 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 3/16 through 1/4 inch diameter.	12
5/16 through 3/8-inch diameter.	14
Carbon – Arc Gouging – For most application.	12
Large diameter carbon electrodes.	14
Soldering.	2
Torch Brazing	5
Light Cutting up to 1 inch.	4
Medium Cutting, 1 inch 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 inch to 1/2 inch.	5 or 6
Gas Welding (heavy) 1/2 inch and over.	6 or 8



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.

#### **79.2.2 Shielding**

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

#### **79.2.3 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 electric arc or oxy/fuel operations, wear, as a minimum, an approved full welding jacket. Flame resistant clothing should not be synthetics, synthetic blends such as nylon, rayon, polyester, etc. Clothing should protect the skin from infrared and ultraviolet radiation, as well as to reduce possibility of it catching fire or melting from hot sparks or hot slag. Protective outerwear such as leather aprons, leather jackets, 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 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.

#### **79.2.4 Cleaning Work Area**

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

### **79.3 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.

### **79.3.1 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.

### **79.3.2 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 loaded boxcar, the door must be open and interior of car 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. Stop welding, heating or cutting 1/2 hour (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.

### **79.3.3 Welding, Heating or Cutting on Tank Cars**

When making repairs to tank cars, other than maintenance of way water cars, follow precautions outlined in Rule 79.3.2 (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, heating or cutting 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 70.22 (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 near welding or torch burning repairs being performed on other equipment.

## **79.4 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. Hoses showing leaks, burns, worn places, evidence of damage from flashback or other defects must be replaced.

## **79.5 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 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 instructions.

## **79.6 Ventilation**

Work in areas that have ventilation.

Exposure to lead, zinc or other welding fumes requires use of an approved respirator and permit. Employee must be fit tested for the appropriate respirator. Spray or dust respirators are not suitable and must not be used.

## **79.7 Confined Space**

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).

### **Safety Precautions**

Follow confined space entry procedures when working in tanks, vats, boilers, sewers, etc.

- Only trained and authorized employees may enter a confined space.
- Provide general mechanical or local exhaust ventilation before and during the welding operation.
- Use respiratory protection.
- Know emergency evacuation measures.
- Test the welding equipment for leaks before entering a confined space.
- Test the atmosphere inside the tank, vat, etc.
- Keep the oxygen/fuel gas cylinders outside the confined space.
- Remove oxygen/fuel gas equipment, or inert gas used for electrical welding, from confined space when not in use.

## **79.8 *Fire or Explosive Potential***

Do not weld or cut on piston heads, hollow casting or containers such as drums, barrels or tanks until the following conditions are met.

- Determine what the container last held. Thoroughly steam and wash out any container that held volatile or flammable materials.
- After thoroughly cleaning, remove plugs or caps and further safeguard a container that 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.

## **79.9 *Use of Oxygen***

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

## **79.10 *Oil and Grease***

Do not allow oil and grease to come in contact with oxygen.

- 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.

### **79.11 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.

### **79.12 Exposure to Excessive Heat**

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

### **79.13 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, is available for this operation and should be used.

## **79.14 Cylinders**

### **79.14.1 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 1/2 hour 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, use matches, 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).

#### **79.14.2 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.
- Do not leave cylinders standing upright unless they are secured to a suitable support with a chain or other holder.
- Block cylinders lying on the ground to prevent rolling.

Cylinders may be lifted by a crane, derrick or hoist only when a company-approved lifting device is used, and employees have been instructed on its use. Do not use an electric magnet to lift cylinders.

#### **79.14.3 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.

#### **79.14.4 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.

#### **79.14.5 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.

#### **79.14.6 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, to remove any possible gas mixture.

### **79.15 Regulators**

#### **79.15.1 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 without gauges are not approved for service and provide no means to check pressures.



### **79.15.2 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.

### **79.15.3 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 sparks, flame or other possible sources of ignition.

### **79.15.4 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.

## **79.16 Operating Valves**

### **79.16.1 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 and 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.

#### **79.16.2 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.

#### **79.16.3 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.

#### **79.16.4 Torch Valves**

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

### **79.17 Use of 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.

#### **79.17.1 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.

### **79.17.2 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.

## **79.18 Use of 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.

### **79.18.1 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.

### **79.18.2 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 blowpipe.

## **79.19 Use of Natural Gas**

When heating with natural gas, welders may use a regular welding torch with natural gas heating heads. Do not use natural gas for welding.

## **ELECTRICAL WELDING**

### **79.20 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.**

### **79.21 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.

### **79.22 Cable Connectors**

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.

### **79.23 Portable Welding Machines**

Power supply cables to portable welding machines must include a conductor (colored green) 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.

## **79.24 Grounding Electrical Arc Welding**

When performing electrical arc welding on machinery or equipment of any kind, apply the ground cable to the part, 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.

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

## **79.25 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 2 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.

## **79.26 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 placed or protected so they cannot make electrical contact with employees or conducting objects.

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

## **79.27 Polarity Switch**

Because of the danger of arcing and damage to the polarity switch, setting of the polarity switch on a welding machine must not be changed while it is operating under welding current load.

## **79.28 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.
- Dust 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.

All employees applying Cad weld bonds must wear goggles and face shields.

## **80 WALKING/WORKING SURFACES**

### ***80.1 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 conditions underfoot. Aisles, stairways, and walkways must be kept free of tools, trucks, materials, equipment, and obstructions.

### ***80.2 Precautions Against Slips, Trips and Falls***

Take precautions to avoid slipping on:

- Slick surfaces such as recently washed and/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.

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, make sure your front foot is flat before moving your rear foot.

### **80.3 Stairways**

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.

### **80.4 Look Both Directions**

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

### **80.5 Avoid Jumping**

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

### **80.6 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.

### **80.7 Conveyors**

Do not ride on or step across conveyors.

### **80.8 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.

### **80.9 Turntables**

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

### **80.10 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).



### **80.11 Approved Ladders**

Use only ladders, which have been approved by the Safety Department. Standing on boxes, barrels, chairs or other improvised supports is prohibited. Only equipment approved for this purpose may be used.

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

### **80.12 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 ladder 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 non-slip 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.

### **80.13 Storage of Ladders and Steps**

Ladders and portable steps must be properly stored.

### **80.14 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. Ladder must be secured to prevent movement. Do not use a ladder in a horizontal position as a runway or scaffold.

### **80.15 Extension Ladders**

Assemble and carefully raise to ensure that guides and hooks are properly engaged.

## **80.16 Metal Ladders**

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

## **80.17 Ascending or Descending**

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

## **80.18 Near Doors and Aisles**

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

## **80.19 Climbing with Tools or Materials**

Do not climb ladders with tools or materials in your hands. Tools should 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.

## **80.20 Stepladders**

A stepladder must not be used unless it is fully opened and the spreaders properly set. Stepladders 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.

## **80.21 Platforms**

Platforms more than 8 feet above the ground or floor must have guard rails with a nominal height of 42 inches, a mid-rail at one-half the height distance of the top rail and toe board of at least 4 inches high on all open sides and ends.

## **80.22 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.

## **80.23 Fall Protection**

Do not work on bridges, elevated structures or the roofs of cars and locomotives without proper authority. Comply with appropriate departmental instructions and the Fall Protection Policy. See Railroad Operating Rule 1.21 (Occupying Roof).

# **81 WORKING AROUND TRACKS OR BEING ON EQUIPMENT**

## **81.1 Precautions Around Tracks and Moving Equipment**

### **81.1.1 Walking on or Near Tracks**

When walking, use designated walkways or toe paths while looking out for conditions that may affect safe footing. When you need to refer to switch list, do so while standing still and in the clear of tracks.

Do not stand or sit on, walk fouling of or walk between rails or 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 solely 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.

### **81.1.2 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 provide warnings.

### **81.1.3 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 engines or cars if anyone is foul of your movement.

## **81.2 Crossing Tracks**

### **81.2.1 Step Over Rail**

Step over rails, frogs, switches, guardrails, etc. when walking near or crossing tracks. Walk straight across tracks when possible.

### **81.2.2 Sufficient Distance**

Maintain a safe distance from equipment and do not:

- Cross or step foul of tracks closely in front of or behind moving equipment or close to the end of equipment.
- Go between standing equipment if the opening is less than 50 feet.
- Cross tracks in front of or behind standing equipment unless there is at least 20 feet between the employee and the equipment.

In locomotive and car repair facilities where equipment has been spotted for repair, and the distance between that equipment or around the end of equipment is less than specified, employees may go between or around the equipment if the equipment is under Blue Signal Protection of Workmen in accordance with Railroad Operating Rule 5.13 and the employee knows that no movement will be made by the equipment.

## **81.3 Safety Appliances**

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

Do not use defective safety appliances. Warn others and report the defect to the proper authority as soon as possible.

## **81.4 Getting On or Off Equipment**

Do not get on or off cars and engines (whether standing or moving) except when required in the performance of duty and only when it can be done safely.

**Getting on or off moving equipment is prohibited.**

The Operating, Mechanical and Engineering Departments prohibit employees from getting on or off *moving* equipment. Equipment must be stopped or standing before getting on or off. No one may get on or off moving equipment in designated Locomotive Servicing Facilities.

### **81.4.1 Standing Equipment**

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

- Observe condition of equipment, looking for defects such as bent, loose or missing stirrups, ladder rungs, hand holds and brake platforms.
- Always use the provided appliances (stepladders and handholds) 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 handhold 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.
- Never place lantern on your arm when climbing on equipment. Hold lantern at base of thumb between thumb and index finger. When working at night, shine your lantern on area where you plan to get off, looking for obstructions.

#### **81.4.2 Moving Equipment**

When necessary to get off moving equipment in an emergency, employees must observe all precautions required for getting on and off standing equipment. Employees must make every effort to stop the movement prior to getting off moving equipment. In addition, the following precautions must also be taken:

- Speed getting off must not exceed walking speed (no more than 4 mph) except in an emergency.
- 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.
- Get off the leading end of moving cars, except you may get off the trailing end of the last car of the cut.
- Do not get on or off equipment at the instant it couples to other equipment.
- Do not step or jump from one moving freight car to another moving or standing car.

### **81.5 Crossing Through or Fouling Equipment**

Do not get on, cross through, crawl, sit or lie under cars, regardless of whether cars are standing or moving, unless duties require. When duties require, conduct a job briefing that includes all involved, assuring that all movement has stopped and that no unexpected movement will occur.

#### **81.5.1 Standing Equipment**

When duties require crossing through a standing train or cut of cars:

- Choose equipment carefully, using only cars with ends equipped with a crossover platform and hand holds. On trains where crossover platforms are not available, use end of car structural bracing, if safe to do so. If suitable car cannot be found, you may use the body of an empty flat car. If no structural bracing is available, do not cross through.
- 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.
- Never place any part of your body between coupler horn and end sill, regardless of whether car is equipped with standard draft gear arrangement, sliding sill arrangement or end-of-car cushioning device.
- When you get off on opposite side, check for movement on adjacent track while maintaining three-point contact with ladders, stirrups and handholds.

### **81.5.2 Reserved**

### **81.5.3 Moving Equipment**

Do not cross under, over, through or ride between moving cars. You are never permitted to cross over moving equipment, except on a locomotive. Remember as you walk across platform, do not loiter. Maintain a secure grasp on railings and grab irons, remaining aware of your footing conditions.

## **81.5.4 Fouling Equipment (RedZone)**

### **What is Red Zone:**

Anytime a Train, Engine or Yard employee is working within an area where there is the potential to be struck by moving equipment, crossing through equipment and/or fouling equipment.

Note: This applies to TE&Y employees only. All other crafts will be governed by their department's rules.

### **When to Establish Red Zone:**

Employees must establish protection before:

- Fouling equipment.
- Making adjustments to equipment.
- Crossing through cars.

### **Who Must Establish Red Zone Protection:**

Employees must establish protection with each crew member prior to entering the Red Zone when equipment is:

- Coupled to an occupied engine, or other motive equipment.
- On the same track as another occupied engine or equipment coupled to an occupied engine
- Exceptions:
- Operating a uncoupling lever.
- Rule 5.13 is in effect.

**How to Establish Red Zone Protection:**

1. Request Red Zone:

Request over Radio: All Employee(s) requesting Red Zone must indicate the job ID or engine number and the track to be fouled.

2. Actions Required Before Entering the Red Zone:

A. When equipment is attached to an occupied locomotive(s), the engineer or primary control operator must:

- Allow movement to stop and slack to adjust.
- Fully apply independent brakes and apply train airbrakes if necessary. (Brakes must not be released until all employees are clear of the Red Zone.)
- Center the reverser / direction selector
- Announce over the radio confirming job or locomotive id, red zone, set and centered condition, and name of the track to be protected. (i.e. "UP 2246, set and centered, track 6, over.")

B. When no occupied locomotive is on the track:

- Announce job ID and track to be fouled over the radio.

**Performing Work in Red Zones in a Yard:**

Employees performing work in the Red Zone within a Yard must:

1. First communicate with job(s) near tracks to be fouled, and if necessary, contact yardmaster or employee in charge to ascertain which jobs are working. Do not establish a Red Zone if:
  - Cars will be kicked, shoved, or pulled from the track or tracks to be fouled.
2. Provide additional protection when necessary to make a coupler adjustment (81.13.2) by:
  - Waiting for the slack to adjust and know that all movement is stopped.
  - Tying a sufficient number of handbrakes, with a minimum of 2, on the end of the equipment closest to the employee working when it is not coupled to an occupied locomotive where a "set and centered" can be established.
  - If unable to secure the unattached portion, pull the equipment onto the lead to perform the work or have another employee be a lookout until work is completed.

**Releasing Red Zone Protection:**

Crew Member on Ground:

- Each employee who established Red Zone Protection must announce by radio when they are clear of the red zone before movement can be made.
- Crew Member at Controls:



- Engineer must confirm release of the Red Zone over the radio from all employees who requested Red Zone.

## **81.6 *Placing Feet***

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

## **81.7 *Riding on Moving Equipment***

Do not ride on moving equipment unless your duties require, or you have proper authority. Mechanical Department employees are prohibited from riding any freight car.

### **81.7.1 *Designated Riding Places***

When required to ride on cars, engines, or other equipment:

- Ride on designated steps, ladders, or platforms.
- Do not ride on side ladders leading to engine cabs.
- Maintain three-point contact (two feet and one hand or two hands and one foot). Maintain a firm grasp on the handhold and have feet solidly placed in stirrup or on ladder rung.
- Do not ride on end ladders or other end parts of moving cars.
- Do not sit with feet protruding over the sides or ends of cars or equipment.

When riding on the side of an engine, car or other equipment, face the direction of the movement. Be alert to close clearance conditions in the direction of movement, such as gate support posts, gates, loading docks or racks, sides of buildings, hanging spouts, pipes or cars on adjacent tracks. DO NOT ride a car into an area marked by signs indicating “Close Clearance” or “Will Not Clear Man on Top or Side of Car.” Stop the movement and get off the equipment. Walk ahead a sufficient distance to observe the movement.

When moving over or in a street or highway crossing, do not ride on sill step, lower rung of ladders, or engine steps. Position yourself high enough on the side of the equipment so not to be struck by a highway vehicle that does not stop at a highway grade crossing.

### **81.7.2 Slack Action**

When on or in engines, cars or other equipment, anticipate and protect yourself from sudden stops, starts, slack action or unexpected motions. When duties require moving around in equipment, be adequately braced, maintain a firm handhold and sit down quickly and safely. 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.

### **81.7.3 Avoiding Shifting Lading**

Do not ride, 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. Do not put yourself in a position where you can be struck by improperly or non-secured drop ends that may fall inward. Do not use the end gate of a gondola for a handhold.

### **81.7.4 Riding Flat Cars or Intermodal Cars**

Avoid riding flat cars, unless equipped with two vertically mounted handholds. If necessary to ride empty 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.

In addition:

- Do not get on or off any flat car in motion.
- Riding the side of any flat car or any type of intermodal equipment not equipped with a vertical mounted handhold is prohibited.
- Observe for close clearance and, if necessary, stop the movement. Protect in advance of further movement from the ground.

#### **Riding Bulkhead Flat Cars**

Do not ride on loaded bulkhead flat cars. When riding empty bulkhead flat cars, position yourself on the side of the deck behind the bulkhead. Maintain three-point contact with a firm grip on the grab iron and face the direction of movement.

### **81.7.5 Riding Tank Cars**

Employees may only ride a tank car when the tank car is the first car of a shoving movement or the last car in a cut of cars being handled.

Employees must maintain three or four-point contact and:

When shoving:

- Be on leading end of leading car.
- Be positioned to ride behind the safety bar outside the gage of the track. On cars equipped with two vertical handholds or if unable to ride behind the safety bar, employee may ride on the outer portion of the crossover platform facing direction of movement, positioned outside the gauge of the track.
- Place both feet on the car to provide secure contact with the car. If unable to place both feet in a secure position, employee must not ride the car.
- When pulling:
- Place both feet on the car to provide secure contact with the car. If unable to place both feet in a secure position, employee must not ride the car.
- Be on the trailing end platform of the last car, facing the direction of movement. Place both feet on the end platform to provide secure contact with the car.

### **81.7.6 Riding Locomotive Cranes and Work Equipment**

Do not go out on a ledge, running board or any other outside part of moving locomotive cranes or other roadway equipment.

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

### **81.7.7 Riding in Locomotive Cabs**

Protect yourself from slack action by remaining seated as much as possible. When seated on a locomotive, keep both feet on the floor. When in a locomotive cab and you are required to move from your seat, do so expecting slack action and have firm hand hold on grab rails, edges of bulkheads and/or brake stand to prevent being thrown about. Duties may require you to stand on a locomotive for an extended period. An example would be behind the engineer for train inspection on a curve. Stand with feet placed a shoulder-width apart, one foot slightly ahead of the other, with hands braced on wall or grab irons when available.

## **81.8 Close Clearances**

### **81.8.1 Avoiding 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. When machines, tools, material, or other equipment may foul adjacent tracks, notify the proper authority immediately.

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.

### **81.8.2 Maintain Lookout**

Keep a careful lookout in both directions for trains, engines, or cars 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.

### **81.8.3 Impaired Clearances**

Do not ride on the side of a car or engine that is next to a structure. Do not position yourself or allow others to position themselves between a structure, building, platform, or overhead loading/unloading device and moving car(s) or engine(s).

## **81.9 Cars in Motion**

Do not break seals, remove hasps, open or close freight car doors or perform repairs while cars are in motion.

## **81.10 Moving Equipment in Locomotive, Car or Maintenance of Way Repair Facilities**

Before moving any equipment, a job safety briefing (Railroad Safety Rule 70.3) will be conducted between all involved in the move that must include a thorough understanding of what will happen and what hand signals or radio communication 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, movement must be stopped. See Railroad Operating Rule 5.3.3 (Signal Disappearance). If radio communication is used, distance and direction must be specified. See Railroad Operating Rule 2.13 (In Place of Hand Signals).

### **81.10.1 Using Mobile Equipment**

When using Track mobiles, car mover or other work equipment as the prime mover:

- A ground man must be in position to protect the movement when the operator is not controlling in the direction of movement.
- When spotting operation involves movement of less than ten feet, the movement may be made without a ground man ahead of the movement.

### **81.10.2 Using Locomotive**

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.

- 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.
- 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 a 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 operating rules. Follow applicable engine shut down policy.

### **81.10.3 One Person Operations**

Where one person is employed, or is the only employee available to move locomotives or cars, movement may be made as follows:

1. Ensure that the area is protected in accordance with Railroad Operating Rule 5.13 (Blue Signal Protection of Workmen).
2. Determine by visual inspection that no person is on, under or between the equipment. Confirm that no personnel or rolling equipment will enter track where move is to be made.
3. Determine by visual inspection that other equipment or structures will not be struck, or insufficient clearances created, by moving locomotives or equipment.
4. On locomotives, place the independent brake valve handle in the service zone and make a visual inspection to ensure that brakes apply. After ensuring that brakes are operational on the controlling unit, release hand brakes.
5. Turn on headlight to the front and rear when possible.
6. On locomotives, ring the bell before moving and during the entire movement.

7. Sound the whistle prior to moving, when reversing direction of movement, when approaching crossing and when employees or others are seen within the area of movement.
8. Operate the locomotive or controlling equipment facing the direction of movement whenever possible. Stop before coupling and then proceed to make coupling.
9. After coupling to other equipment, stretch the slack to ensure the coupling was made.
10. Do not make movements farther than the distance inspected in steps 2 or 3 above, unless additional visual inspections are completed.
11. After movement is complete, secure all locomotives and/or equipment as per operating rules. Follow applicable engine shut down policy.

## **81.11 Hand Brakes**

When operating hand brakes, inspect for defects and use good body mechanics. Have firm footing and handhold to prevent slipping, falling or injuries (e.g. sprains or strains). When applying or releasing wheel type brake, thumb must be positioned on the outside of the wheel.

**Locomotive hand brakes.** Locomotive hand brakes must be applied or released from a position on the equipment.

- **To apply wheel-type hand brakes:**

- a) Inspect area where you will be standing for obvious defects.
- b) Maintain proper stance with one foot slightly on front of the other, knees slightly bent and your back as straight as possible.
- c) Operate the wheel in such a manner to always have your thumb on the outside of the wheel rim. Do not use wheel spokes to apply brake.
- d) Wind the slack out of the chain by turning the wheel in a clockwise direction until resistance is felt. Be prepared for unexpected bunching or slipping of brake chain.
- e) Now, with legs slightly bent, keeping back as straight as possible, pull upward using short, steady strokes until reasonable force has been applied against felt resistance. Let your leg muscles do the work.

f) Never jerk or lunge on a brake wheel.

- **To release wheel-type hand brakes:**

- a) Always inspect area where you will be standing. When releasing wheel-type hand brakes, turn the wheel in a counter-clockwise direction while maintaining the proper stance as outlined above. Do not use wheel spokes to release the brake.
- b) Never place your foot in the wheel spoke to release the vertical wheel-type hand brake.

- **To apply lever-type hand brakes:**

- a) As always, inspect the area where you will be standing for obvious defects and maintain the proper stance.
- b) Position yourself clear of the arc of travel of the operating lever.
- c) With one leg slightly bent and back as straight as possible, grasp the end of the operating lever and apply the brake using steady, smooth strokes.
- d) As tension increases, shorten strokes and let your leg muscles do the work until brake is applied, using reasonable force against felt resistance.
- e) Be prepared for unexpected bunching or slipping of brake chain.

- **To release lever-type hand brakes:**

- a) Position yourself clear of the chain weight and operating lever before pulling up on the release lever.
- b) When operating the release lever, maintain the proper stance and use a smooth, steady pull.

**End-mounted brake on equipment equipped with a brake step or platform.**

When climbing on equipment, maintain at least a three-point contact. Three-point contact consists of having both feet and one hand or both hands and one foot touching the equipment. Always be on the left side of hand brake while operating the mechanism. 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 handhold with your left hand and operate the brake with your right hand. Grip the wheel in such a manner to always have your thumb on the outside of wheel rim. Do not use the wheel spokes to apply or



release a hand brake. *End-mounted brakes must not be applied or released from the ground.*

- **To apply**, wind slack out of the chain by turning the wheel in a clockwise direction until resistance is felt. Be prepared for unexpected bunching or slipping of brake chain. With legs slightly bent and keeping your back as straight as possible, pull upward using short, steady strokes, with leg muscles doing the work. Exert reasonable force against the felt resistance to operate the brake mechanism.
- **To release**, turn the wheel in a counter-clockwise direction or operate release lever as indicated, keeping all parts of your body clear of the wheel in case it should spin during release. 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 can use good body mechanics while operating them. Inspect for sound footing around the area where you will stand while operating the hand brake. Inspect the brake mechanism for obvious defects. Do not attempt to operate the hand brake if defective. If no defects are found, face the brake lever with the left side of your body closest to the car. Place feet shoulder width apart with one foot slightly in front of the other. Grasp lever at its end with your left hand. Keep your back straight and operate the lever through its arc of travel with a slight rocking motion of your body. Apply the brake, using reasonable force against the felt resistance of the brake mechanism. Be prepared for unexpected bunching or slipping of brake chain.

**End-mounted hand brake on TOFC/COFC 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.

If operated from the ground, inspect the area for sound footing and use good body mechanics while operating.

If operated from a position on the car, place feet securely in the stirrup or ladder rung with one hand holding onto the ladder rung or grab iron and the other at the end of the lever. Brake may also be operated from the empty deck of TOFC/COFC car, while using good body mechanics, placing one hand on the grab iron and the other hand on the end of lever.

Inspect the brake mechanism for obvious defects. Do not attempt to operate the hand brake if defective (broken housing, kinked chain, etc.). Operate the hand brake by moving the lever smoothly through its arc of movement. Apply the brake, using reasonable force against the felt resistance of the brake mechanism. Be prepared for unexpected bunching or slipping of brake chain.

**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**:

- Use end ladders to go up or down the car.
- Brace any part of your body against another car.
- Place feet in a wheel or on a hand brake lever or pawl.
- Hold brake tension on a moving car by hand without using a pawl and ratchet.
- Place undue strain on your body which may cause physical injury.

#### **81.11.1 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 airbrake 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.

#### **81.11.2 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 the proper authority.

### **81.12 Wheel Chocks**

When locomotives are left unattended, locomotive wheels must be chocked against movement where required. When installing or removing wheel chocks, keep all parts of your body outside of the rail and avoid pinch points:

- When applying blocking chains, wheel chocks or other blocking material to locomotive wheels, always check overhead clearance when crouching to apply chains or blocking material, and check clearance again before rising. Afford yourself sufficient clearance so that hands and fingers are not caught between the chain or material and the wheel or brake rigging.
- When using blocking chains, hold each handle rod at its center, then lay one chain portion over the top of the rail clear of the wheel and brake rigging. Keeping hand in the clear, slide the chain along the rail to a solid contact against the wheel. Repeat the process with the other chain portion.
- When using other blocking material, use a piece of material that is long enough to enable you to place the material under the brake rigging and against the wheel without catching hands or fingers. Always store blocking chains on the hooks provided. Never store chains, wheel chocks or other items on steps or walkways.

### ***81.13 Coupling and Uncoupling***

When couplings are being made, do not ride the side of cars to point of impact. Stand in the clear when a coupling or uncoupling is being made.

Operate the uncoupling lever with hand next to equipment and face direction of movement. Do not use your feet to operate the uncoupling lever.

Do not use excessive force or jerk on the uncoupling lever, which may cause physical injury. Do not operate an uncoupling lever on a car or engine while riding on another car or engine.

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

If uncoupling lever does not operate, cross over the equipment and operate the uncoupling lever on the opposite side.

Use the uncoupling lever to open knuckles when possible. If you must use hands to open the knuckles 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. Make sure the knuckle pin is in before putting your hand on the knuckle.

When air hose is charged, turn your face away from the air hose while uncoupling. See Railroad Safety Rule 81.13.5 (Coupling and Uncoupling Hoses).

### **81.13.1 Going Between Cars**

Do not go between or in front of a moving engine or car to arrange knuckles or couplers, to manipulate other appliances or for any other reason.

### **81.13.2 Coupler and End Sill**

Do not place any part of the body on or between a coupler and car end sill, even if the car is equipped with standard draft gear arrangements, sliding sill arrangements or an end-of-car cushioning device.

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

### **81.13.3 Coupler Adjustment**

When necessary to make coupler adjustment:

- Separate equipment at least 50 feet and ensure equipment is stopped. Secure standing equipment with hand brakes.
- Obtain RED ZONE protection from engineer and have a clear understanding of work to be performed with any other crew members involved.
- When manually adjusting couplers, carefully follow procedures outlined in Railroad Safety Rule 75.1 (Lifting and Moving Materials).
- Face coupler squarely, get as close as possible, keeping your back straight. Lift with your leg muscles and move coupler to the desired position.
- If, after using reasonable force, coupler does not move to the desired position, obtain help.
- When help is obtained, you must position one person as previously described and the second person on the side of the coupler, prepared to push. Designate one person to control the movement and work as a team on that person's command.
- Avoid lifting the full weight of couplers.
- Do not kick or use your foot to make a coupler adjustment.

- Coupler must move without applying excessive force (if unable to make the adjustment using reasonable force, use a coupler alignment strap, if available).

#### **81.13.4 Using a Coupler Alignment Strap**

When using a coupler alignment strap to adjust misaligned couplers, the following procedures must be used.

1. Separate the cars with misaligned coupler(s) by at least 50 feet.
2. Apply sufficient hand brakes to secure the car(s) not coupled to the engine.
3. Close knuckles on both cars and check that the locking blocks have dropped.
4. Check for large burrs on the knuckle surface that could cut or damage the nylon material of the strap. If a burr or other defect is discovered that would damage the strap, change the knuckle or notify mechanical personnel for assistance.
5. Place one loop on the strap inside the closed knuckle on the misaligned coupler. Lay the remaining strap material on the top of the coupler shank.
6. Move the equipment together until the couplers are about three feet apart.
7. Keeping one foot outside the rail, place the remaining strap loop inside the closed knuckle of the coupler to be used for pulling.
8. Stand clear of the track and the alignment strap.
9. Move the engine very slowly in the direction that tightens the strap until the coupler is centered.
10. Move the engine in the direction that puts slack back into the strap, until about three feet separates the equipment.
11. Keep one foot outside the rail. Lift the uncoupling lever to open the knuckle and remove the strap.
12. Remove the strap from the other knuckle.

## **Replacing Knuckles**

Use the correct knuckle type:

1. Keep your feet clear of the area under the coupler to the extent possible, make sure the knuckle pin is in place, then open the knuckle.
2. Remove the pin and place within easy reach.
3. Remove the knuckle from the coupler and holding it as close to the body as possible, dispose of it where it will not become a tripping hazard.
4. Holding the uncoupling lever up, move the knuckle thrower back into the coupler recess as far as it will go.
5. Use good body mechanics and lift the knuckle and place it into the coupler pocket.
6. Insert the knuckle pin into the pinhole, close the knuckle and check to see that it locks properly. Do not close it with your foot.

## **Opening Angle Cock**

Do not kick, strike or shake pressurized hose couplings. Turning angle cock on moving equipment is prohibited.

### **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 just above the knee with vent port directed away from you.
3. Turn your face away from the glad hand before opening the angle cock.

When opening the angle cock, the following procedure must be used:

1. Open angle cock slowly. Do not use excessive force.
2. Keep your legs and feet clear of the air hose coupling.
3. Listen for air escaping, which will indicate a faulty coupling, which may fly apart.

4. If an air leak is heard, close both angle cocks and make sure the pressure in the hoses is fully depleted before attempting adjustment or repair.

### **81.13.5 Coupling and Uncoupling Hoses**

Avoid being struck or burned when coupling air hoses or steam connections.

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 air hoses together 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.

When coupling hoses:

1. Stoop down and reach for the opposite air hose end (or “glad hand”) with your left hand.
2. Grasp the “glad hand” of the hose closest to you with your right hand and bend it back in the crook of your right arm.
3. While holding the opposite air hose under the couplers, drop the “glad hand” of the hose in your right hand into the “glad hand” of the hose in your left hand.
4. After hoses are coupled, slowly stand up and while maintaining a lookout in both directions, step back outside and clear of the equipment. Be prepared for any sudden movement.

When necessary to part air brake train line hose connections or locomotive control connections, close the angle or cutout cocks, grasp the hoses firmly, and turn your face away while making the uncoupling.

## **81.14 Dump Cars**

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.

Note: See Railroad Operating Rule 1.35 (Dump Doors).

## **81.15 Car Doors**

When opening or closing doors, keep fingers clear of the edge, doorjamb, 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 doorstops 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.

## **81.16 Load Dividers**

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 a load divider. While operating load dividers, fingers must be kept clear of pinch points and feet clear of gate swing to avoid foot injury.



## **81.17 Cars Being Loaded or Unloaded**

Personnel who load or unload cars are responsible to:

- Remove and clear platforms, boards, tank car couplings and connections, conveyors, 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.

Note: See Railroad Operating Rule 7.8 (Coupling or Moving Cars on Tracks Where Cars are Being Loaded or Unloaded).

## **81.18 Loading Roadway Equipment**

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

At stations where mechanical department personnel are not available, cars loaded with roadway machinery must not be moved until authorized by the proper authority. The supervisor must not authorize movement until receiving advice that the cars are loaded per loading rules and are safe for movement. The supervisor must request mechanical department personnel at the first inspection point en-route.

Cars loaded with roadway equipment must receive frequent inspection en-route and must be inspected by mechanical department personnel at the first point they are available.

## **81.19 Air Brake Rigging**

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.

## **81.20 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. When entering equipment, be prepared for missing floor panels. See Railroad Safety Rule 81.21.3 (Locomotive Cab Floor). Equipment varies in step and ladder arrangement. Know your equipment. Do not allow tools, chains or other items to be placed where you must 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 to report it promptly if you cannot correct it yourself.

## **81.21 Locomotives, Working On or About**

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, contactor relays or related

electrical apparatus without first shutting off all power. A voltmeter must be used to ensure all current has been disconnected before starting repairs.

### **81.21.1 General Requirements**

While working on or about locomotives:

- Know that all workmen are in a safe position before starting an engine.
- Always use door handles or grab irons to open and close doors. Keep hands and fingers clear of door edges and jambs. Always maintain secure hold on hand holds, railings or other secure fixtures to prevent being thrown about.
- Keep all electrical and other compartment doors securely latched so you will not run into them. Report all defective latches and doors that won't stay closed.
- Keep safety guards in position and fastened.
- Keep hands out of radiator shutters and all other equipment that engage automatically.
- Always watch your footing closely. Locomotives vary in step and ladder arrangement. Know your equipment. Keep engine room, cab, running boards, catwalks, steps and grab irons clean and free from oil, grease, rags, debris, obstructions, snow, ice, sand, etc. Do not allow tools, chains or other items to be placed where you must step.
- Place material or equipment on locomotives where it will not create a hazard while being transported.
- When carrying a grip on a locomotive, one hand must be kept free. Hold the grip in front of you to prevent it from catching on objects. Before climbing up or down locomotive steps or ladders, first place your grip on the platform, then climb up or down facing the equipment using both hands.
- If you observe oil or other foreign substances on ladders, steps or walkways, warn other crew members and if practicable, avoid using that part of the equipment until the unsafe condition is corrected. Be sure you report it properly if you cannot correct it yourself.
- At night, have a plastic case flashlight in good working order and keep it with you.

### 81.21.2 Restrictions

**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.

### 81.21.3 Locomotive Cab Floor

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

- “Danger - Floor Out” 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 floorboards 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.

#### **81.21.4 Pinch Points**

When performing tasks on locomotives, be aware of and keep fingers and hands out of areas designated here as pinch points that are created by the operation of:

- Seat adjuster mechanisms.
- Sliding windows.
- Cab doors.
- Engine compartment doors.
- Hand brake operating and releasing levers.

### ***81.22 Securing Supply Apparatus***

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

## **82 HANDLING SWITCHES & DERAILS**

### ***82.1 Switches and Derails - Authority***

Unauthorized persons must not unlock or handle switches or derails.

### ***82.2 Operating Switch by Hand***

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

**Trailing point movement:** Stop movement not less than 50 feet from switch points to prevent tension being placed on switch points and switch handle.

**Facing point movement:** Stop movement a sufficient distance 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.

### **82.3 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, maintenance and other operating conditions.

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 to 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 switch lever handle or ball.

Note: See Railroad Operating Rule 8.2 (Position of Switches).

### **82.4 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.

### **82.5 Spiked Switches**

Apply a “Switch Out of Service” tag to any inoperable switch or switch requiring maintenance. Spike switch when necessary.

**CAUTION: Do not rely solely on tags for identifying spiked switches. Report the switches to a supervisor.**

## **82.6 Operating High/Low Stand Switches**

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, using your leg muscles and not your back, keeping the body clear of handle movement. Have feet approximately shoulder width apart, firmly on the ground, with one foot placed slightly in front of the other. Keep your back as straight as possible, with your legs bent.
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. If the handle becomes hard to move, stop and take a new position to avoid twisting or straining back muscles. If handle stops at any point as you are pulling it through its arc of travel, reset handle to its original position and inspect switch points for foreign objects. If foreign objects are found, remove them with a stick (never use your fingers) and complete the movement.

If the switch cannot be operated using reasonable force, help must be obtained.

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.

**Two-Hand Method** - When using the two-hand method:

1. Stand facing the switch stand and place both hands near the end of the handle.
2. Lift up the switch handle, keeping your back as straight as possible and your legs slightly bent.

**Mast-Support Method** - When using the mast-support method:

1. Place one hand on the mast and the other hand on the end of the handle.
2. Stand parallel to the handle and slowly pull the handle through the line of travel.
3. After completing the move, stand as close to the handle to clear the body, and push the handle down.

## **82.7 Operating Ground-Throw Switch**

When operating a ground-throw switch:

1. Observe switch points, looking for any obvious obstructions. Take a firm stance and be alert for conditions that might cause loss of footing.
2. Stand parallel to handle movement, with your stance centered over the lever arm handle. Be sure that your body is clear of the arc of travel of the switch lever. If the switch is equipped with a foot latch, keep your foot on the latch until you move the lever toward the one-half position.
3. Hand or other object must not be used to release the latch. The switch lever may be under compression and could fly up when released from the latch or keeper.
4. Stand as close as possible to the lever arm, placing one hand on your knee or on top of the switch staff for support.
5. Place your other hand on the handle and lift up slowly and smoothly.
6. Once the lever has traveled at least to the straight up position, reposition your feet and hands so that lever movement may be complete with a pushing motion. Do not kick or otherwise use your feet to move a switch lever. If switch becomes difficult to throw, stop and take a position to avoid personal injury. If switch stops, return lever to its original position and inspect switch points for obstruction. If obstructions are found, remove them with a stick (never use fingers or hand) and complete movement.
7. If necessary, complete the last 6 inches of movement by placing one foot near the end of the lever and stepping down until the lever arm is latched.

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



## **82.8 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 sign on the switch stand.
- or
- The switch bottom portion of stand painted yellow.

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 to depress the foot pedal.

Should switch point lock not operate properly, do not use hands, feet or other object to return mechanism to proper position. Report the condition promptly to the proper authority.

## **82.9 Spring Switch**

When operating high-stand spring switches, the procedure is the same as for high-stand rigid switches with the following exceptions:

- To complete the last two or three inches of movement it may be necessary to use both hands on the switch handle. When this becomes necessary, stop and take a new position to avoid muscle strain to your back. Be sure your footing is firm and your feet are shoulder-width apart with one foot slightly in front of the other. Keeping your back straight, pull handle to slot. Do not jerk or push on switch handle.
- The procedure for throwing lever-type spring switches is the same as for lever-type ground throw switches.

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.

## **82.10 Power Switch**

Take precautions to avoid injury when working on power-operated, remote, 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.

## **82.11 Switch Heaters**

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

## **82.12 Submarine Switch**

When operating submarine switches (those types of switches located in a box below ground level), the procedure for throwing the switch lever is basically the same as for ground throw switches, with the following exceptions:

- You may place the knee closest to the lid on the ground to aid in giving you better balance. Take a firm grip on the lid lift ring or handle and keep your back as straight as possible while lifting lid. Be certain that the area where you place your knee is clear of obstructions.
- With the lid open and after inspecting lever compartment for debris, re-adjust body position if necessary and throw lever.
- Close the lid from the backside to avoid closing lid on your foot.
- When this type of switch is in a public street or road, make certain that protection against vehicular traffic is provided.

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