

# Equipment Handling Rules



## **Chapter 1 - General Rules**

### **4001 - Inspecting the Loading of Cars When Switching**

- 4001.1** When switching industry tracks or other locations where cars are being loaded or unloaded, notify the appropriate personnel, check any overhead or side clearances to make certain that the car will clear, and do not move a car that:
- a. Is loaded heavily on one side or one end, or
  - b. Is overloaded, or
  - c. Has lading projecting over the ends or sides.

### **4002 - Handling Machinery That Has a Boom Attached**

- 4002.1** When handling machinery that has a boom attached, make certain that all booms are in the trailing position, except when:
- a. Moving in work trains or wreck trains over short distances, such as to and from the work location, or
  - b. The Engineering Department employee-in-charge confirms that the lading is tied down properly and that any booms are properly secured, or
  - c. The machinery is a military tank with its gun barrel attached.

### **4003 - CSXT Train Documentation**

- 4003.1** Freight train crews must have appropriate train documentation before the train departs its originating point except when authorized by the chief train dispatcher.
- 4003.2** When relieved before reaching the final destination, leave any train documentation, except Emergency Response Guide, on the controlling locomotive in a location where it can be easily found.

### **4004 - Reserved**

### **4005 - Required Equipment and Tags**

- 4005.1** At the beginning of a tour of duty, at least one crewmember must have in their possession:
1. A 200 degree temperature testing crayon (Tempilstik), and
  2. Six (6) Hot Box / Air Brake Cut-Out tags.

### **4006 - Setting Out Defective Equipment for Repair**

- 4006.1** When setting out defective equipment, when possible, place it where it can be accessed by a vehicle for repair or inspection.

## Chapter 8 - Train Rules

### 4400 - Train Speed

**4400.1** When handling any of the following trains, do not exceed the speed listed:

Type of Train	Maximum Speed	Remarks
Amtrak passenger trains handling TOW (trailer-on-wheels) equipment	90 MPH	None
Trains handling Amtrak mail handling cars	60 MPH	MHC 1400-1569 series cars
TOW Train	60 MPH	TOW trains may operate at the speed for intermodal trains, but not exceeding 60 MPH.
Trains handling one or more railcars loaded with engineering equipment	50 MPH	None
Trains handling one or more wood rack cars or bulk head flats	50 MPH	None
Circus/Carnival Trains	50 MPH	RBXX 001-999 series cars JESX 001-100 series cars
Freight trains handling one or more empty cars, except solid intermodal trains with empty TOFC/COFC and multilevel autorack cars.	As indicated in remarks	50 MPH - Applies if the train has any empty car that is not included in the 60 MPH category below.  60 MPH - Freight trains whose only empty cars are Tropicana TPIX cars of any series, CSXT 198000- 199999 series cars, ARMN 110000-111449 series cars, CRYX 5800-5899 series cars, TOFC/COFC, or multi-level autorack cars.
Unit Trains	50 MPH	Applies to solid loaded unit trains of coal, coke, grain, or minerals.
Trains handling gondolas loaded with stump wood	50 MPH	None
Trains handling one or more empty cars in the UTLX 83000-83080 series	40 MPH	None
Trains handling one or more loaded coal cars	40 MPH	Applies only if restricted by train documentation due to weight.
Trains handling camp cars	40 MPH	Includes Univan Camp Cars.
Trains handling snow plows or ditcher spreaders	25 MPH	None
Locomotives or cars being shoved	30 MPH	Does not apply to helper operations.

Trains handling ice breaker cars	10 MPH	Applies only when being used to break ice, moving through tunnels.
Trains handling air dump cars	As indicated in remarks	30 MPH when handling 70 ton maintenance of way air side dump cars (220,000 GRL or less). 45 MPH when handling 100 ton maintenance of way air side dump cars (263,000 GRL). 50 MPH when handling all other air dump cars.
Trains handling welded or continuously jointed rail.	As indicated in remarks	40 MPH and further restricted to 10 MPH when crossing thru-truss bridges and going through turnouts, crossovers, or tunnels.
Trains handling wreck cranes or derricks	As indicated in remarks	35 MPH, when pulling. 20 MPH, when shoving.
Trains handling Type SF1A, SF1B, and/or SF2A flangers	As indicated in remarks	50 MPH when secured for movement in a train. 30 MPH when flanging and pulling. 5 MPH when flanging and shoving, and 5 MPH when flanging and passing station platforms, highway crossings at grade, and equipment on adjacent tracks.
Trains handling loaded box cars	60 MPH	None
Loaded TIH/PIH Cars	50 MPH	None
Trains handling gondolas with initials NYC, CR, or PRC	40 MPH	Only applies when restriction is listed in train documents.
Trains handling cars with initials CWP	45 MPH	Only applies when restriction is listed in train documents.
Trains handling cars with initials DRGW	As indicated in remarks	40 MPH - when empty and restriction is listed in train documents. 50 MPH when loaded and restriction is listed in train documents.
Trains handling CSXT and CR track geometry cars	As indicated in remarks	60 MPH when testing Passenger speed when not testing
Trains handling NS track geometry and research/test cars	60 MPH	None

## **4458 - Moving Defective or Damaged Cars**

**4458.1** Before moving a defective or damaged car:

1. Obtain instructions from the Mechanical and Transportation Departments, and
2. Inform the train dispatcher of the movement.

## **4459 - Reporting Defective, Damaged, or Improperly Loaded Cars at an Interchange Location Where There is No Car Inspector On-Duty**

**4459.1** When a defective, damaged, or improperly loaded car is offered for delivery to CSXT, inform the train dispatcher of the following items:

1. The car's initials and number,
2. The nature of the defect(s),
3. The identification of the contents, and
4. The destination of the car, if known.

## **4460 - Spotting TOFC or COFC Cars for Drive-On Loading or Unloading**

**4460.1** When spotting TOFC or COFC cars for drive-on loading or unloading, make certain that:

1. All the cars are coupled,
2. The slack is adjusted to permit the proper positioning of bridge plates, and
3. The hand brake is applied on each car.

## **4461 - Spotting Auto Rack Cars for Loading or Unloading**

**4461.1** When spotting autorack cars for loading or unloading, make certain that:

1. All the cars are coupled,
2. The slack is not bunched so as to permit proper placement of portable bridge plates, and
3. The hand brake is applied on the first, last, and every fourth car in the group of cars.

## **4462 - Handling Loaded Auto Rack Cars**

**4462.1** Do not place loaded autorack cars directly behind an open top car loaded with sand, gravel, coal, or similar commodity.

**4462.2** Do not place loaded autorack cars directly in front of or behind flat cars or open top cars loaded with a shiftable commodity that protrudes or may protrude beyond the car ends.

**4464.3** When a train handling one or more TTOX or TTFX single-axle cars requires a helper locomotive on the rear, limit the helper as follows:

1. When using an AC locomotive:
  1. Use only one (1) locomotive,
  2. Limit the locomotive's output to 100 Kilopounds, and
  3. Isolate and, weather permitting, shutdown all other locomotives in the helper locomotive consist.
2. When using one or more DC locomotives:
  1. Limit horsepower to 6,000,
  2. Limit the number of powered axles to twelve (12),
  3. Isolate and, weather permitting, shutdown all other locomotives in the helper locomotive consist, and
  4. Limit tractive effort as follows:
    1. 1,000 amps, when the helper has less than 4,000 total horsepower,
    2. 900 amps, when the helper has between 4,000 and 5,000 total horsepower, and
    3. 800 amps, when the helper has over 5,000 horsepower.

## **4465 - Handling Blocks of 30 or more "Heavy" Loads**

**4465.1** Blocks of thirty (30) or more heavy loaded cars, or commodities of similar weight, must be on the head end of the train directly behind the locomotive consist.

## **4466 - Placing Empty Cars in Trains**

**4466.1** Blocks of thirty (30) or more empty cars must not have more than five (5) loaded cars trailing the rear car in the block.

**4466.2** When handling light empty flat cars in other than an intermodal train, comply with the following:

1. When the train's tonnage exceeds 6,000, do not place one or more light empty flat cars over 80 feet long within the first five (5) cars,
2. In unit trains, place the cars on the rear of the train, and
3. When picking up cars on line-of-road, determine the length of the car(s) being picked up by adding five (5) feet to the inside length stenciled on the side of the car.

**4466.3** Light empty flat cars of type F126 or F226 with initials GTTX, TILX, TINX or NKCR, must be placed on the rear of the train.

**4467 - Reserved**

**4468 - Reserved**

**4469 - Reserved**

**Coupler Mate Bogie** - A freight car truck that permits the locomotive to couple to the head end of a TOW train. The coupler mate freight car truck has a coupler/socket on one end to connect to a trailer and a railroad coupler on other end to connect to a locomotive. Each coupler mate bogie shall be equipped with a tool box containing appropriate instructions, job aids, and the necessary tools and equipment required to address problems that may be encountered en route.

**CSX Train Documentation** - A computer-generated document consisting of some or all of the following:

- Tonnage Graph
- Restricted and Special Handling List
- CT-168 Report
- Clearance Bureau Instructions
- Train Listing and Hazardous Material Descriptions
- Hazardous Special Handling Instructions
- Hazardous Materials Radio Waybill Form

**Double Stack Car (DS)** - A car designed to carry a trailer or container(s). When carrying containers, one container may be placed on top of another.

**Engineering Department Specialized Equipment** - Sperry Cars, geometry measurement system (GMS) cars, rail grinders, undercutters, ballast cleaners, and/or ditchers.

**Track geometry cars include:**

- CSXT 999302 (TGC2)
- CSXT 994366 (TGC3)
- CR 21 and CR 22.
- NS 31, NS 33, and NS 34.

**Research cars include:**

- CSXT 994501.
- CR 19.
- NS 32 and NS 49
- GECX 90
- BNSF 82 and BNSF 83.

**GMS/TSBV equipment includes:**

- GMS 1
- GMS 2

**Flanger** - A piece of equipment used to clear flangeways of snow.

**Heavy Duty Flat Car** - A flat car with eight or more axles.

**Heavy Load** - Car loads containing the following commodities are considered "heavy" loads:

- Coal,
- Coke,
- Grain,
- Ore,
- Phosphates,
- Limerock,
- Sand,
- Salt,
- Minerals,
- Aggregates, or
- Steel or lead ingots

**Hump** - A method of switching cars by pushing them over a hill and letting gravity propel them into classification tracks.

# Air Brake Train Handling





**5003.2** To cut out an air brake on a car:

1. Close the cut-out cock in the brake pipe branch pipe by placing the handle in line with the pipe,
2. Release all air pressure from reservoirs by holding the brake cylinder release rod to its fullest travel until the air has exhausted,
3. Verify that the brake cylinder piston retracts into the brake cylinder, and
4. Verify that the brake shoes are away from the wheels.

**5003.3** After cutting out the air brakes on a car, or when picking up a car that has been tagged due to inoperative air brakes:

1. Notify the locomotive operator and the train dispatcher,
2. Apply a completed Air Brake Cut-Out Tag to the brake pipe branch pipe cut-out cock,
3. Check for the presence of a completed defective equipment tag on both sides of the freight car when picking up a car known to have inoperative brakes, and
4. Provide information regarding the location of a freight car(s) having inoperative air brakes in Section 6 of the brake test certificate and on CSXT train documentation.

**5003.4** When the car's air brakes have been cut out while enroute:

1. Set the car out at the next point where it can be repaired, and
2. If the next point is beyond the end of your run, notify the train dispatcher about the car.

## **5004 - Standard Brake Pipe Pressure**

**5004.1** Standard Brake Pipe Pressure must be adjusted to:

- a. 110 PSI on Passenger Trains, including Amtrak's "Auto Trains", or
- b. 90 PSI on all other trains including trains with freight and passenger cars.

## **5005 - Avoiding an Overcharge Condition**

**5005.1** When doubling cars or coupling cars to a train, make a full service brake pipe reduction after coupling is made and before the angle cock is opened.

**5005.2** When charging a train from other than the head end, adjust the brake pipe pressure to 15 PSI below the standard pressure for that train.

## **Chapter 2 - Locomotive Air Brake Equipment**

### **5051 - Monitoring Brakes**

- 5051.1** When applying train brakes, monitor equalizing reservoir pressure because the brake pipe pressure will reduce at a slower rate.
- 5051.2** Monitor all locomotive air pressure gauges and indications to detect changes that may affect the operation of the locomotive or train.

### **5052 - Adjusting Brake Equipment**

- 5052.1** When adjusting equalizing reservoir pressure the automatic brake handle must be placed in the RELEASE position with the automatic brake valve cut OUT.
- 5052.2** When cutting in the automatic brake:
1. The automatic brake handle must be placed in the RELEASE position, and
  2. Note equalizing reservoir pressure is not increasing before placing the automatic brake cut-out valve to the IN position.

### **5053 - Ensuring Proper Brake Cylinder Pressure**

- 5053.1** Excessive Locomotive Brake Cylinder Piston Travel must be reported when the actual piston travel is within 2 inches of the maximum piston travel shown in block 10 on Form FRA-F6180-49A.
- 5053.2** If the locomotive brake cylinder pressure reading differs by 3 PSI or more from posted plate or decal inside the cab when brake is fully applied, report the condition on the Locomotive Work Report.
- 5053.3** The locomotive brake cylinder pressure adjustment must not be altered.
- 5053.4** Do not block the independent brake so that it actuates the air brakes continuously.

### **5054 - PASS Position**

- 5054.1** Do not use the "PASS" position on a 3-position automatic brake cut-out valve in freight service.
- 5054.2** The "PASS" position on a 3-position brake cut-out valve may only be used when:
1. In passenger service, and
  2. Each car's control valve is set for graduated release.

## **Chapter 3 - Air Brake Test, General Requirements**

### **5101 - Performing Air Brake Tests**

- 5101.1** Only qualified personnel may operate air brake controls on a locomotive for the purpose of performing air brake tests.
- 5101.2** When performing air brake tests, air pressure must be determined at the rear of the train or cut of cars by:
- a. Telemetry that has been qualified, or
  - b. An air gauge on a locomotive coupled to the rear of the train or cut of cars, or
  - c. An air gauge in the EOT or marker unit, or
  - d. An accurate hand-held air gauge.
- 5101.3** When performing air brake tests, it must be determined that air brakes on the rear of the train or cut of cars have applied and released by:
- a. Qualified Telemetry, or
  - b. Observing that the brake cylinder piston properly responds to air brake operation, or
  - c. Observing that a brake pipe gauge at the rear of the train responds to air brake operation.
- Note: When an air brake test is performed, a 5 PSI brake pipe reduction indicates application and a 5 PSI brake pipe increase after an application is made indicates a release.*
- 5101.4** After an air brake test, make certain brake pipe pressure is being restored at the rear of the train before proceeding.

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## **Chapter 5 - Performing Train Air Brake Inspections and Tests**

### **5201 - Inspection of Brake Equipment**

**5201.1** Prior to performing a brake test, make certain that:

1. Air hoses are in serviceable condition and properly coupled,
2. The regulating valve is adjusted to the standard pressure for the train being tested,
3. Angle cocks, end cocks, and cutout cocks are properly positioned, and
4. If the train is equipped with electro-pneumatic brakes, brake circuit cables are properly connected.

### **5202 - Methods for Testing Brake Pipe Leakage**

**5202.1** When equipped with an air flow indicator use the Air Flow Method (AFM) to test brake pipe leakage by:

1. Charging the brake pipe pressure at the rear car to 75 PSI for freight train and 95 PSI for passenger trains,
2. Verifying that the airflow indicator shows 60 CFM or less,
3. Obtaining the required signal to begin test,
4. Making a 20 PSI brake pipe reduction and allow brake pipe exhaust to stop, and
5. Receiving the required signal before releasing the air brakes.

**5202.2** If your train is not equipped to permit an AFM test, make a Brake Pipe Leakage Test by:

1. Charging the brake pipe pressure at the rear car to 75 PSI for freight train and 95 PSI for passenger trains,
2. Obtaining the required signal to begin the test,
3. Making a 20 PSI brake pipe reduction and allow brake pipe exhaust to stop,
4. Cutting out the automatic brake and wait one minute,
5. Noting the brake pipe pressure and measure brake pipe leakage one additional minute, and
6. Receiving the required signal before releasing the air brakes.

**5202.3** If leakage test reveals air flow is greater than 60 CFM or exceeds 5 PSI per minute:

1. Notify employee inspecting cars,
2. Inspect the brake pipe for leaks,
3. Make necessary repairs, and
4. Retest.

**5202.4** Verify or enter brake pipe leakage information on the brake test certificate. Information must be recorded as “AFM” when the airflow method has been used or the amount of leakage per minute when the brake pipe leakage method has been used.

## **5203 - Class I Brake Test**

**5203.1** A Class I brake test must be performed on the entire train:

- a. Where the train is originally assembled, or
- b. At the train’s point of origin (initial terminal) regardless of where the cars were assembled except trains received at interchange, or
- c. When the train has been off of air more than four hours, or
- d. When adding or removing more than one solid block of cars, or
- e. When a unit or cycle train designated in special instructions, has traveled 3,000 miles since its last Class I test, or
- f. By a qualified mechanical inspector at destination, when an extended haul train is designated in special instructions and has traveled 1,500 miles.

**5203.2** A Class I brake test is not required on the entire train:

- a. When removing a single car or one solid block of cars, or
- b. When adding a previously tested car or one previously tested solid block of cars, or
- c. Removing defective cars regardless of the number or location of defective cars, or
- d. Change in locomotive consist or EOT, or
- e. Any combination of the above.

**5203.3** Before being added to a train at an intermediate location, cars must receive a Class I brake test.

**5203.4** A solid block of cars can be added to a through train without performing a Class I brake test on the entire train as long as the cars being added are:

1. Assembled into one block and receive a Class I brake test as one block, and
2. Not off air for more than four hours before being added to the train.

**5203.5** A solid block of cars that receive a Class I brake test as one solid block may be placed in multiple tracks prior to being added to a through train so long as the cars are:

1. Reassembled in the same standing order before being added to a through train, and
2. Not off air more than four hours before being added to a through train.

**5203.6** When a train is split at a location, only one section of the train may be designated as the continuing train. The continuing train must retain the original train ID. The other sections of the train:

- a. May be added as a solid block of cars to another through train, or
- b. Must have a Class I brake test if the section becomes an originating train or part of an originating train.

## **5204 - Class III Brake Test**

**5204.1** Perform a Class III brake test when cars have not been off air for more than 4 hours:

- a. Class III Train Line Continuity test when the train has been separated and recoupled without any change to the train's consist, or
- b. Train Consist Change test when:
  - a. A locomotive or caboose is changed, or
  - b. A car or solid block of cars is removed from the train, or
  - c. At locations other than the train's initial terminal, and cars added from a previous train have remained coupled in same order with the train line remaining connected unless:
    - a) Removing defective equipment from the solid block, or
    - b) Separated into multiple blocks due to track constraints and the cars will be re-coupled in the same order as removed.

## **5205 - Transfer Brake Test**

**5205.1** Perform a Transfer Train brake test on cars not previously tested when making a transfer train movement that will not exceed 20 miles.

## **5206 - Helper Brake Test**

**5206.1** Perform a Helper Service brake test anytime a helper locomotive is added to a train.

## **5207 - Class IA Air Brake Test**

**5207.1** Perform a Class 1A brake test at points designated in Special Instructions.

## 5208 - Additional Inspections

**5208.1** In addition to the inspections required when adding cars to a train, the following must be inspected when performing a brake test:

1. Air brake cylinder piston travel is correct when determined to be:
  - a. 6-9 inches on body mounted brakes, or
  - b. A maximum of 6 inches on truck-mounted brakes, or
  - c. As specified by the badge plate of the car.
2. Brake rigging does not bind or foul,
3. Brake equipment is properly secured,
4. Retaining valves are in the EXHAUST position,
5. Retaining valve pipes are in serviceable condition, and
6. Both sides of the car are examined during the inspection process to observe the functioning of all moving parts of the brake system.

## 5209 - Air Brake test Procedures

**5209.1** Comply with the following chart when performing required brake test:

Action	Class I	Class IA	Class III Train Line Continuity	Class III Train Consist Change	Transfer	Helper
<b>Pre-Test &amp; Start of Test</b>						
Safety Inspection	X	X		X	X	
Charge brake pipe to within 15 PSI of regulating valve setting	X, X <sup>5</sup>	X		X	X	
Obtain required signal to begin test	X, X <sup>5</sup>	X				
Leakage Test	X	X				
20 PSI Brake Pipe Reduction	X, X <sup>5</sup>	X		X	X	X, <sup>1</sup>
<b>Brake Application and Inspection on Rear Car</b>						
All Cars	X	X			X	
Rear Car	X <sup>5</sup>			X		X <sup>2</sup>
<b>Release Brakes</b>						
All Cars	X, X <sup>4</sup>					
Rear Car	X <sup>5</sup>			X		X <sup>3</sup>
Brake pipe restored on rear as indicated by gauge	X	X	X	X		

X <sup>1</sup>	If train brake is already applied, make additional 10 PSI brake pipe reduction.
X <sup>2</sup>	Rear car or Helper locomotive(s) with visual inspection on each helper locomotive that brake system operates from a 20 PSI reduction initiated from controlling locomotive.
X <sup>3</sup>	Rear car or Helper locomotive at the rear of the train.
X <sup>4</sup>	Roll-by inspection permitted at speeds not exceeding 10 MPH and results must be communicated to the locomotive operator.
X <sup>5</sup>	When test has been made using air source other than outbound locomotive.

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## **Chapter 9 - Fundamentals of Trainhandling**

### **5501 - General Train Handling Requirements**

**5501.1** Train Handling requires proper planning and use of the safest and most efficient train handling procedures, Locomotive Operators must not make rapid or severe slack changes.

**5501.2** When planning and executing train handling procedures, the following must be considered:

1. Locomotive consist capabilities, including:
  - a. Distributive Power, or
  - b. Helper Locomotive
2. Train speed, weight, and length,
3. Number and position of loaded and empty cars,
4. Amount of brake pipe leakage,
5. Physical characteristics such as grade, curves, turnouts and fixed signals,
6. Authorized speed, and
7. Weather conditions.

### **5502 - Tractive Effort**

**5502.1** Maximum trailing tonnage for a train handled with head-end power only, will not exceed the tonnage rating for two (2) CW44ACs and one (1) C40-8 or CW40-8 locomotives.

**5502.2** On grades where the tonnage limitation will be exceeded, trains must:

- a. Have a rear-end helper, or
- b. Have an appropriately positioned in-train helper, or
- c. Reduce tonnage.

**5502.3** The number of powered axles in use must not exceed 27 when pulling a train or cut of cars.

**5502.4** Helper locomotive consist must not exceed the equivalent axle value of the head end consist. When more axles than permitted are needed to move a train, the helper locomotive must be placed into the train with approximately 70% of the helper locomotive tonnage rating behind the helper locomotive.

**5502.5** When calculating powered axles the locomotive operator must:

1. Count AC locomotives as 9 axles, and
2. When necessary to reduce powered axles, isolate locomotives from the rear of the consist forward.



**5505.3** Actuate the independent brake:

- a. 4 seconds for each locomotive in the consist to ensure brakes are released on trailing locomotives, or
- b. Frequently when using the dynamic brakes and the train brakes at the same time, or
- c. In the position that will develop the required locomotive brake cylinder pressure when using the automatic brake and locomotive brake cylinder pressure is desired.

**5506 - Train Braking with Automatic Brake**

**5506.1** When using the automatic brake, stop the train if and when you feel the train brake is not holding or slowing the trains speed properly. If necessary, stop the train using an emergency brake application and if equipped, using two-way telemetry.

**5506.2** Initial brake pipe reductions must be:

- a. 6 to 8 pounds when the train brake system is fully charged, or
- b. At least 3 pounds greater than the total previous reduction when the train brake system is not fully recharged.

**5506.3** When operating conditions permit, wait at least 20 seconds after the initial brake pipe reduction before making additional 2 to 3 pound intermediate brake pipe reductions.

**5506.4** Locomotive Operators must not place the automatic brake beyond the suppression position to apply train brakes, except for placing train brakes in emergency.

**5506.5** When making a final brake pipe reduction:

- a. Just prior to stopping, make sufficient brake pipe reduction that results in an exhaust from the brake pipe as stop is completed, or
- b. On passenger trains, the graduated release feature may be used.

**5506.6** Except for emergency applications, or when required by rule, brake pipe reductions must not be made after brake pipe pressure reaches the point of equalization.

**Brake Pipe Equalization Chart**

Regulating Valve Setting	Reduction Required for Equalization (Full Service)	Pressure in Brake Pipe and Brake Cylinder
70 PSI	20 PSI	50 PSI
80 PSI	23 PSI	57 PSI
90 PSI	26 PSI	64 PSI
100 PSI	29 PSI	71 PSI
110 PSI	32 PSI	78 PSI

## 5507 - Dynamic Brake Operations - General

**5507.1** In order for the dynamic brake to operate, the following switches and circuit breakers must be positioned as indicated:

Dynamic brake control circuit breaker, controlling locomotive	ON
Dynamic brake cut out switch	IN
Brake transfer circuit breaker	ON

**5507.2** Locomotive Operators must determine the operational status of the dynamic brakes on all locomotives in the consist at:

- a. The initial terminal for a train, or
- b. Other locations where a Locomotive Operator first begins operation of a train.

**5507.3** If status of the dynamic brakes cannot be determined, the Locomotive Operator must test the dynamic brakes at the first opportunity.

**5507.4** Locomotive Operators must note any problem on the locomotive work report relating to the dynamic brake and provide information pertaining to the dynamic brake operation on the brake test certificate including:

1. Locomotive number,
2. Dynamic brake cut-out position,
3. Total number of dynamic brake axles, and
4. The total number of locomotives with inoperative dynamic brakes.

**5507.5** When a locomotive is discovered as having an inoperative dynamic brake, a tag labeled Inoperative Dynamic Brake must be placed on the isolation switch. Once tagged the locomotive may continue in service for up to 30 days. The tag must contain the following:

1. Locomotive number,
2. Name of discovering carrier,
3. Location and date where condition was discovered, and
4. Signature of the person discovering the condition.

**5507.6** Do not exceed the following maximum dynamic brake axle value for the locomotive consist:

- a. 27 – when all units have alignment control couplers, or
- b. 20 – when any unit has coupler limiting blocks, or
- c. Do not use dynamic braking when any locomotive in the consist is not equipped with alignment control couplers or coupler limiting blocks.

**Dynamic Brake Axle Value**

Locomotive Class	Axle Value	Locomotive Class	Axle Value
All 4-axle units except B40-8	4	SD70AC, SD70M	8
B40-8	5	CW44AC, CW44AH, ES44AC, ES44AH, ET44AC, ET44AH	9
All 6 axle units except SD60/M/I, SD70M, C/CW40-8, CW44-9, and ACs	6	SD70ACE	10
SD60/M/I, C/CW40-8, CW44-9, ES44DC, ES40DC, ES44C4, ET44C4	7	CW46AC, CW46AH	11

**5507.7** When restricting the dynamic brake axle value, the locomotive operator must:

1. Place the dynamic brake cut-out switch in the OUT position,
2. Leave the dynamic brake on the controlling locomotive cut in, and
3. Report the status of the dynamic brake cut-out switch position in section 3 of the brake test certificate.

**5507.8** When using dynamic brake through turnouts and crossovers and the dynamic brake axle value exceeds 12, do not exceed #4 position until the head one-third of the train clears turnouts or crossovers.

**5507.9** If the dynamic brake warning light comes on, gradually reduce dynamic brake output until the light goes out.

## **Chapter 10 - Conventional Train Handling**

### **5551 - Starting a Train**

**5551.1** When starting a train:

1. Allow sufficient time for the train air brakes to release,
2. When possible, start movement one car at a time using the lowest throttle position needed,
3. Do not exceed 2 MPH until the entire train is moving, and
4. Avoid using excessive tractive effort.

**5551.2** Locomotive operators must handle the train in a safe and fuel-efficient manner and take full advantage of throttle adjustments and dynamic braking when conditions permit.

### **5552 - Dynamic Braking**

**5552.1** If in doubt that the train speed is slowing, stopping or controlled properly, supplement dynamic brakes with train brakes.

**5552.2** Plan the use of dynamic brakes to avoid maximum braking through heavy curvature, crossovers, and turnouts.

**5552.3** When applying dynamic brakes:

1. Make certain that the throttle is in IDLE for at least 10 seconds before transition to dynamic brake SETUP,
2. Allow time for the train's slack to adjust,
3. Apply the dynamic brake gradually allowing for slack to adjust, and
4. Make incremental adjustments to maintain or achieve the desired speed.

**5552.4** When releasing dynamic brake:

1. Do so gradually, allowing for slack to adjust, and
2. When releasing the dynamic brake and automatic brake, keep the dynamic brake applied until the train's air brakes have released.

**5552.5** Just prior to stopping, gradually apply the independent brake while moving the dynamic brake lever to the SETUP or OFF position.

## 5553 - Use of Automatic Brake

### 5553.1 When braking:

1. Begin far enough in advance to allow for a split service application, except when stopping with the slack bunched, and
2. Actuate the independent brake frequently to release locomotive brake cylinder pressure.

### 5553.2 When braking **Without Power**:

1. Reduce the throttle to IDLE allowing the slack to adjust, and
2. If necessary, use the dynamic brake or independent brake, if the dynamic brake is not available to adjust the slack prior to making the initial brake pipe reduction.

### 5553.3 When braking **With Power**:

1. Advance throttle, if necessary, using only enough power to adjust slack,
2. Observe locomotive output when making the initial brake pipe reduction , and
3. Make additional brake pipe reductions as necessary.

### 5553.4 When making a running release:

- a. After the desired braking has been accomplished, brakes may be released if:
  1. Brake pipe air is not exhausting,
  2. At least a 10 PSI brake pipe reduction has been made, and
  3. Brakes on the entire train will be released before the speed has reached:
    - a. 10 MPH for trains 120 cars or less, or
    - b. 15 MPH for trains over 120 cars.
- b. When slack is bunched, do not allow a run out of slack until the brakes have released, or
- c. Do not increase locomotive throttle while the brakes are releasing.

### 5553.5 When making a standing release and operating conditions permit:

1. Make a full service brake pipe reduction,
2. Make certain that brake pipe exhaust has stopped for at least 20 seconds before releasing the train brake, and
3. In locations where the independent brake will not hold the train, apply sufficient handbrakes to secure the train during recharge time.

## 5557 - Approaching and Operating Through Areas with Temporary Speed Restrictions

**5557.1** When conditions permit, Locomotive Operators must:

1. Release the train air brakes before entering the restriction,
2. Minimize changes in train speed or slack condition, and
3. Limit dynamic brake position to #4.

## 5558 - Steep Grade (1% or more) Train Handling

**5558.1** When approaching and descending steep grades, Locomotive Operators must:

1. Ensure the air brake system is charged to the required pressure before starting the descent,
2. Know the severity of the grade the train is on,
3. Take appropriate action to control train speed, and
4. When conditions warrant, apply train brakes and dynamic brakes before the movement begins.

**5558.2** If necessary to reduce the brake pipe pressure by 18 PSI or more, do not:

1. Pull the train for more than 2 miles, and
2. Exceed 20 MPH.

**5558.3** If the speed of the train cannot be maintained at or below authorized speed, immediately place the train in EMERGENCY.

**5558.4** Apply train brakes using at least a 6 to 8 PSI brake pipe reduction in conjunction with dynamic braking when:

1. Operating in territories where both dynamic braking and pressure maintaining are required in lieu of retainer valves being set, and
2. Train speed is between 20 and 35 MPH.

**5558.5** Use steep grade charts in the Time Table Special Instructions to identify steep grade locations and operating instructions.

**5558.6** When calculating Effective Dynamic Brake Axles (EDBA) consider:

1. Helper or DP locomotives with working dynamic brakes as added EDBA value, and
2. Total trailing tonnage will include the weight of any locomotives not operating in dynamic brake mode.

**5558.7** When controlling train speed on descending grade, use dynamic braking and if necessary, supplement with the automatic brake.

**5558.8** Trains not meeting the minimum effective dynamic brake requirements must meet one of the following:

- a. Before proceeding, train must obtain additional locomotives, including helper locomotives to meet the EDDBA value, or
- b. Train speed will not exceed 15 MPH and the automatic brake pipe reduction does not attain 18 PSI or higher for a distance of 2 miles or more.

**5558.9** Utilize the TTSI charts to define the minimum EDDBA for the type of train and tonnage to be able to operate at a particular speed.

**5558.10** If the train experiences any loss of dynamic braking resulting in fewer EDDBA than required, the train must be stopped immediately with the automatic brake using emergency.

**5558.11** When a train requires an 18 PSI or greater brake pipe reduction to control speed, the train must:

1. Be stopped immediately with the train brakes using emergency if necessary,
2. Have an additional 6 PSI brake pipe reduction made,
3. Have each car inspected to determine that brakes are operating properly,
4. Have all retainers set in:

1. High pressure position before continuing, and
2. Direct Exhaust position when the train reaches the bottom of the grade.

Note: Trains using retainers may need to be stopped on grade to allow wheels to cool depending on length of grade.

**5558.12** If a train is stopped on a steep grade using an 18 PSI or greater brake pipe reduction, the train must be secured and air brake system recharged before proceeding.

**5558.13** Trains stopped for the purpose or recharging train air brakes must be secured with sufficient hand brakes to hold the train. After the train air brake system is recharged, and retainers are set, if needed make at least a minimum reduction to hold the train while hand brakes are released.

**5558.14** When ascending steep grades at speeds below 15 MPH with head-end power only:

1. Gradually reduce throttle to at least position #6 just before the locomotive crest the grade, and
2. Refrain from increasing throttle position until train has crested the grade and the speed increases.

## **Chapter 11 - Helper Service**

### **5601 - Responsibilities**

- 5601.1** Locomotive operators must maintain radio communication with each other at all times while handling the train and from the leading locomotive consist:
1. Operate the train brakes, and
  2. Make certain that all other Locomotive Operators are informed of planned speed changes, signal indications, and any other condition which may affect train movement.
- 5601.2** The helper operator must comply with instructions from the leading locomotive operator.
- 5601.3** Ensure that the helper locomotive is properly positioned and all crew members have a clear understanding of:
1. Loads, empties, tonnage and any restrictions for the train, and
  2. Number of cars and tons that the helper locomotive is cut in ahead of.
- 5601.4** During all shoving operations, the helper crew will ride in the lead locomotive of helper consist facing the direction of travel while the train is being shoved.

### **5602 - Restrictions**

- 5602.1** Helper locomotives must be equipped with alignment control couplers.
- 5602.2** When reverse movement exceeds one mile, the locomotive operator on the helper locomotive coupled to the rear of a train must control the train air brakes.
- 5602.3** Passenger trains carrying passengers must not be assisted by pushing from the rear of the train.
- 5602.4** Helper crews must uncouple from their own train, if coupled to a train prior to coupling to the train being assisted.



## 5603 - Adding Helper

**5603.1** When adding a helper locomotive to a train without helper link, the helper crew must:

1. Make certain the assisted train has stopped,
2. After coupling, stretch slack to ensure coupling has been made,
3. Apply a Full Service brake pipe application and wait for the brake pipe exhaust to stop,
4. Cut out the Automatic Brake, and place the handle in HANDLE OFF,
5. Couple the brake pipe hoses and open the angle cocks,
6. Place the Independent Brake valve handle in the RELEASE position, actuating to fully release the helper locomotive consists brakes, and
7. Notify the lead locomotive operator that the helper is coupled.

## 5604 - Operating a Helper Equipped Train

**5604.1** The Locomotive Operator on the leading end will direct the starting movement of the train.

**5604.2** When accelerating the locomotive, throttle should be increased gradually. Do not place the helper locomotive throttle in # 8 until the entire train is clear of turnouts or crossovers.

**5604.3** When slowing or stopping the train, the locomotive operator on the helper unit must:

1. Make throttle adjustments that prevents an increase in locomotive output, and
2. Actuate locomotive brake cylinder pressure when the train brakes are applied.

**5604.4** During an emergency stop, the locomotive operator on the helper unit must control brake cylinder pressure to 25 PSI to minimize in-train-forces.

**5604.5** During train movement, if it is necessary for the helper locomotive operator to initiate an emergency brake application, the automatic brake must be placed in emergency position.

## 5605 - Detaching Helper

**5605.1** Train movement must be stopped to detach the helper locomotive, unless equipped with a "Helper Link" or similar device.

## 5606 - Helper Link

**5606.1** After installing the Helper Link or taking charge of a locomotive equipped with a Helper Link, a visual inspection and test must be made to ensure that all hoses and jumper cables will not interfere with the operation of the lift chain which is connected to the coupler.

**5606.2** Helper Link must be inspected and tested as follows:

1. Knuckle on the locomotive end with helper link box must be closed;
2. The trainline power-reduction feature on the helper locomotive must be positioned to full power;
3. Turn on the Engine Run, Generator Field and Control Fuel Pump switches;
4. Reverser must be placed in either Forward or Reverse;
5. Position the Power Reduction switch to “trainline power reduction” (all units);
6. Inspect to verify that the knuckle has been operated by the coupler-lift mechanism, and
7. Turn the trainline power reduction switch to the OFF position.

**Note:** If the coupler pin did not lift, verify the main reservoir equalizing hose, the end cock and jumper cable connections are connected from the helper locomotive to the helper link and repeat steps 2 through 6.

## 5607 - Operating a Helper Link

**5607.1** Prior to coupling to the rear of a train, the helper crew must verify that the knuckle on the helper locomotive is open on the end to be attached to the train.

**5607.2** After coupling to the rear of the train:

1. Stretch slack to ensure the coupling has been made,
2. Apply a full service brake pipe application and wait for the brake pipe exhaust to stop,
3. Cut out the automatic brake, and place the handle in HANDLE OFF, and
4. Make a visual inspection from the walkway of the helper unit ensuring that telemetry device is still in place and none of the hoses will be affected by the coupler once movement begins.

**5607.3** To arm, open the helper link box lid and:

1. Verify the thumbwheel switch assembly numbers are the same as the ID code number on the end of train device,
2. Press the comm/check pushbutton to test communications between the helper link and the end of train telemetry device,
3. Press the enable button to start the electronic signal,
4. Note that the “enable” light is illuminated and close the helper link box lid,
5. Return to the cab and note brake pipe pressure reading,
6. Release the independent brake,
7. Notify the Locomotive Operator on the lead locomotive that the helper is ready for a Helper Service brake test, and
8. Verify that brakes apply and release on the helper unit when the Locomotive Operator performs the brake test from the lead locomotive.