

AIR BRAKE RULES

30.0 AIR BRAKE TESTS

Air Brake and Train Handling Rules

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30.1 General Requirements

30.1.1 Inspecting and Testing Brake EquipmentS

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 brake equipment will help engine and train crew members move their trains safely and efficiently.

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.

A. Freight Car Inspectors Not Immediately Available

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:

- a. Is leaning or listing to the side
- b. Is sagging downward
- c. Is positioned improperly on the truck
- d. Has an object dragging below or extending from the side
- e. Has an insecurely attached door
or
- f. 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 train dispatcher or other 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 air line.

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.

30.1.4 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 Rules 30.2.2 (Procedure for Inspection and Test), 30.5.4 (Picking up Cars Enroute), and 30.6.2 (Procedure for Intermediate 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 brake 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 air flow method, make sure the regulating valves are at the standard setting of 90 psi. The air flow method does not change during cold weather.

30.2 Initial Terminal Road Train 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:

1. Where the train is originally made up (initial terminal).
2. Where the train consist is changed, unless the only change is adding or removing a solid block of cars.
or
3. Where the train is received in interchange and the train consist is changed. An inspection and test is not needed if the train consist is changed by:
 - a. Removing a solid block of cars from the head end or rear end of the train.
 - b. Changing motive power.
 - c. Removing or changing the caboose, if used.
or
 - d. Using any combination of changes a–c.

30.2.2 Procedure for Inspection and Test

Determine which test method will be used. If the controlling locomotive is equipped with a calibrated air flow indicator gauge or a digital flow value displayed as part of an operator's electronic display screen, the air flow 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 air flow 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.

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

Before the test can begin, make sure the AFM indicator reading is at or below 60 CFM. If the reading exceeds 60 CFM, refer to Rule 30.2.3 (Leakage Requirements).

1. Make sure the air flow indicator (AFI) gauge is calibrated. On Union Pacific locomotives, this is shown with a 1/4-inch red dot on the gauge face. When using a locomotive where the AFI is a digital value displayed as part of the operator's electronic display screen, the device is calibrated and no red dot is required.
2. 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).

Apply Brakes. When proper notification has been received to apply the brakes for the test, do the following:

1. Make a 20 pound brake pipe reduction.
2. After the brake pipe air has stopped exhausting at the automatic brake valve, notify the inspector that the brakes are applied for the test.

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.

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:

1. Place the automatic brake valve handle in the RELEASE position.
2. Notify the inspector that the brakes have been released.
3. 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.

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

B. Leakage Test Method

When proper notification has been received to apply brakes for the test, do the following:

1. Make a 20 pound brake pipe reduction.
2. Wait 1 minute after the brake pipe air has stopped exhausting at the automatic brake valve.
3. Cut out the pressure maintaining feature by placing the brake valve cutoff valve in the OUT position.
4. Wait 1 minute for the brake pipe pressure to equalize.
5. 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).
6. Notify the inspector that the brakes are applied for the test.

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.

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:

1. Place the automatic brake valve handle in the RELEASE position.
2. Cut in the pressure maintaining feature by placing the brake valve cutoff valve in the FRT, IN, or PASS position, as appropriate. Union Pacific passenger equipment is not set up for graduated release. Operate passenger equipment, except Amtrak equipment, with the brake valve cutoff valve in the FRT or IN position.
3. Notify the inspector that the brakes have been released.
4. Inspect each brake to make sure all brakes have released. This inspection may occur as the train departs.

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 road train 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.

or

The train that has been inspected will be moved more than 500 miles without being subject to another test.

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.

General Order No. 27 December 17, 2001

Change Rule 30.2.2, Part A, First Paragraph To Read:

Before the test can begin, make sure the AFM indicator reading is at or below 60 CFM. If the reading exceeds 60 CFM, refer to rule 30.2.3 (Leakage Requirements).

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 air flow method the air flow 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).

30.2.4 Testing Train from Yard Test Plant

A. Using Suitable Test Device

When testing the train air brake system from a yard test plant, use a suitable test device to allow the brake pipe air pressure to increase and decrease at the same or a slower rate than it would with an automatic brake valve. Do the following:

1. Connect the yard test plant to the end that will be nearest the controlling locomotive.
2. Test the brakes as outlined in Rule 30.2.2 (Procedure for Inspection and Test).

B. Attaching the Locomotive

Within 2 4 Hours. When the locomotive is attached within 2 4 hours of disconnecting the yard air, conduct an application and release test on the rear car as specified in Rule 30.4 (Application and Release Tests).

More than 2 4 Hours. When the locomotive is attached more than 2 4 hours after disconnecting the yard air, conduct a complete test of the train brakes as specified in Rule 30.2.2 (Procedure for Inspection and Test).

General Order No. 27 December 17, 2001

Change Rule 30.2.4, Part B To Read:

B. Attaching The Locomotive

Within 4 hours. When the locomotive is attached within 4 hours of disconnecting the yard air, conduct an application and release test on the rear car as specified in rule 30.4 (application and release tests).

More than 4 hours. When the locomotive is attached more than 4 hours after disconnecting the yard air, conduct a complete test of the train brakes as specified in rule 30.2.2 (Procedure For Inspection And Test).

30.2.5 Delivering Train List and Tonnage Profile

When a train list/tonnage profile graph is available, the conductor is responsible for ensuring that copies are delivered to the engineer. The engineer must leave the copies on the locomotive for the relieving crew.

If a train list or profile is not available, the conductor must notify the engineer of loads, empties, tonnage, and length of the train.

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.

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 the 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

30.4.1 Procedure for Application and Release Tests

When 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. Determine that the brakes apply on the rear car by doing the following:
 - a. When using an EOT device, make sure at least a 5 pound brake pipe reduction occurs.
 - or
 - b. If a gauge or device is not available, visually determine the application of brakes 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. Determine that the brakes on the rear car release by doing the following:
 - a. When using an EOT device, make sure at least a 5 pound brake pipe increase occurs.
 - or
 - b. If a gauge or device is not available, visually determine the release of brakes on the rear car.

30.5 Road Train and Intermediate Terminal Train Air Brake Tests

30.5.1 Detaching Locomotive or Separating Train

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

A. On Level Track

On level track or at locations where the crew determines that cars will not move if air brakes bleed off, apply the train brakes with a 20 pound brake pipe reduction and then:

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.

B. On a Grade

When detaching the locomotive or separating a train on a grade:

1. Place the retaining valves, if in use, in the EXHAUST position.
2. Apply a sufficient number of hand brakes on the low end to hold the train.
3. Release the automatic and independent brakes and allow the train to close in against the cars that have hand brakes applied.
4. Close the angle cock on the locomotive or on the cars that will be detached with the locomotive.
5. Make sure the angle cock on the portion of the train or cars left standing is left open to allow emergency brake application.

C. While Switching on an Ascending Grade

When switching or performing other operations of short duration where a crew member will remain in the immediate vicinity of the detached portion of the train:

1. Apply hand brakes on the cars to be detached nearest the controlling locomotive.
2. Release the automatic and independent brakes to ensure that the drawbars are fully stretched and that enough hand brakes have been applied to secure the cars.
3. Close the angle cock on the locomotive or on the cars that will be detached with the locomotive.
4. Make sure the angle cock on the portion of the train or cars left standing is left open.

D. During Cold Weather

Vent valves may freeze open when detaching during cold weather. To prevent this, when outside temperature is 15 degrees F or colder, or when directed by the proper authority, do the following:

1. Secure cars as outlined in parts A, B, or C of this rule.
2. Place the automatic brake valve handle in the HANDLE OFF position, and make a 70 pound brake pipe reduction.

3. Place the handle in the SUPPRESSION position to stop the brake pipe reduction.
4. When the brake pipe reduction is complete and the air has stopped exhausting, close the angle cock on the locomotive or on the cars that will be detached with the locomotive.
5. Make sure the angle cock on the portion of the train or cars left standing is left open.

E. Immediate Air Brake Inspection and Repairs

At terminals where facilities are available for immediate air brake inspections and repairs:

1. Secure cars as outlined in parts A or B of this rule.
2. Place the automatic brake valve handle in the HANDLE OFF position, and make a 70 pound brake pipe reduction.
3. Place the handle in the SUPPRESSION position to stop the brake pipe reduction.
4. When the brake pipe reduction is complete and the air has stopped exhausting, close the angle cock on the locomotive or on the cars that will be detached with the locomotive.
5. Make sure the angle cock on the portion of the train or cars left standing is left open.

30.5.2 Recoupling Locomotive or Cars

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

A. On Level Track

When recoupling on level track:

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, as well as on all passenger trains, conduct an application and release test of the brakes as specified in Rule 30.4 (Application and Release Tests).

B. On a Grade

When recoupling on a grade:

1. Verify that the pin has dropped and the coupling has been made before connecting brake pipe hoses and opening angle cocks.
2. Charge the air brake system to within 15 pounds of the locomotive regulating valve setting.
3. If the train is on an ascending grade, make sure the train is completely stretched.
4. If the train consist has not been changed:

a. On a freight train equipped with a brake pipe gauge or device at the rear of the train, crew members must know that 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 at the rear of the train, and on all passenger trains, crew members must conduct an application and release test of the brakes as specified in Rule 30.4 (Application and Release Tests).

5. Release any hand brakes in use.

C. Train Separated More than 2 4 Hours

After recoupling cars that have been separated from the locomotive for more than 2 4 hours, conduct a test and inspection of the brakes on those cars as specified in Rule 30.2.2 (Procedure for Inspection and Test).

General Order No. 27 December 17, 2001

Change Rule 30.5.2, Part C To Read:

C. Train Separated More Than 4 Hours

After recoupling cars that have been separated from the locomotive for more than 4 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 Setting Out Cars or Changing Locomotive Enroute

When setting out cars enroute or changing locomotives at a point other than the initial terminal, complete the following procedures, as appropriate:

A. Detaching

When detaching, follow the procedures specified in Rule 30.5.1 (Detaching Locomotive or Separating Train).

B. Recoupling

When recoupling, follow the procedures specified in Rule 30.5.2 (Recoupling Locomotive or Cars). In addition, in all cases, conduct an application and release test of the brakes as specified in Rule 30.4 (Application and Release Tests).

Before conducting the test, if the locomotive was changed, charge the air brake system to within 15 pounds of the locomotive regulating valve setting.

30.5.4 Picking Up Cars Enroute

When picking up cars enroute, complete the following procedures, as appropriate:

A. Detaching

When detaching, follow the procedures specified in Rule 30.5.1 (Detaching Locomotive or Separating Train).

B. Picking Up a Solid Block of Cars

After adding a solid block of cars to the train, conduct an application and release test as specified in Rule 30.4 (Application and Release Tests).

Before conducting the test, if the train is on a grade, charge the air brake system to within 15 pounds of the locomotive regulating valve setting.

C. Picking Up Other than a Solid Block of Cars

When picking up other than a solid block of cars:

1. Conduct a leakage or air flow test and inspection on the cars being added as specified in Rule 30.2.2 (Procedure for Inspection and Test), according to the following instructions:

a. If a gauge is not available, add the cars to the train before conducting the leakage or air flow test and inspection.

or

b. If a gauge is available, the leakage or air flow test and inspection may be conducted as outlined in part (a) above or before adding cars to the train. If the test and inspection is conducted before adding cars, do the following after the cars are added:

Conduct an application and release test on the entire train as specified in Rule 30.4 (Application and Release Tests).

or

If the train is standing on a grade, charge the air brake system to within 15 pounds of the locomotive regulating valve setting before conducting the application and release test.

2. Verify that the brakes on the rear car of the train apply and release by visually inspecting the brakes or using a device.

Make sure that 100 percent of the brakes on the cars added are operative.

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:

1. Conduct an inspection and test as specified in Rule 30.2.2 (Procedure for Inspection and Test).

30.6 Intermediate Inspections

30.6.1 Location of Intermediate Inspection

Intermediate inspection points are located not more than 1,000 miles apart. At these points, trains that do not require a test and inspection as specified by Rule 30.2.1 (Location of Test) must receive an intermediate inspection and test.

30.6.2 Procedure for Intermediate Inspection and Test

A. Brake Application

Make a 20 pound brake pipe reduction.

At crew change locations, the engineer going off duty can make the brake pipe reduction.

B. Brake Inspection

Inspect the brakes to verify that they apply on each car and the brake rigging is properly secured and does not bind or foul.

C. Leakage Test

Test for leakage using one of the following methods:

1. If using the leakage test method, at least 1 minute after the brake pipe air has stopped exhausting at the automatic brake valve:
 - a. Cut out the pressure maintaining feature by placing the brake valve cutoff valve in the OUT position.
 - b. Wait 1 minute for the brake pipe pressure to equalize.
 - c. Check the brake pipe leakage for 1 minute and make sure the leakage does not exceed 5 pounds per minute. If leakage exceeds 5 pounds per minute, refer to Rule 30.2.3 (Leakage Requirements).or
2. If using the air flow method, after the brake application inspection is complete, release the brakes and:
 - a. Recharge the air brake system to within 15 pounds of the locomotive regulating valve setting.
 - b. Make sure the AFI reading is at or below 60 CFM before the train departs. If the reading exceeds 60 CFM, refer to Rule 30.2.3 (Leakage Requirements).

30.7 Running Tests of Passenger Trains

30.7.1 Locations of Running Test

Conduct a running test of the air brakes on passenger trains at the following locations:

1. When the train is leaving any point where a locomotive was added to or detached from the train.
 2. When the engine crew or train crew has been changed.
 3. When an angle cock has been closed. However, the running test is not required when cars are cut off from the rear end of the train only.
- or
4. Before the train leaves a summit of heavy grades, at points designated by the timetable or general order.

30.7.2 Procedure for Running Test

Conduct a running test by completing the following steps:

1. Begin the running test of the brakes as soon as train speed is high enough to prevent stalling.
2. While using enough power to keep the train stretched:
 - a. Apply the train brakes with enough force to determine whether the train brakes are operating properly.
 - b. Keep the locomotive brakes released during the test.
3. If the train brakes are operating properly, release the brakes and proceed.

30.7.3 Brakes Not Operating Properly

If the train brakes are not operating properly, stop the train immediately and do the following:

1. Inspect the brakes to identify and correct the problem.
2. Before proceeding, conduct an application and release test as specified in Rule 30.4 (Application and Release Tests).
3. Once the train is proceeding, immediately repeat the running test as specified in Rule 30.7.2 (Procedure for Running Test).

30.8 Locomotive Daily Inspection

30.8.1 Sufficient Number of Forms

To comply with requirements specified in Rule 30.8 (Locomotive Daily Inspection) and Rule 30.9 (Conditions Found Enroute), engineers must keep a supply of:

Locomotive Inspection Report Forms (Form 25005)
Inspection Record Cards (Form 25044)
Non-Complying Tags (Form 25213)

30.8.2 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. This may be UP Form 25044, or the equivalent form from another railroad.

Union Pacific locomotives have an entry in the "REMARKS" section at the bottom of the blue card (Form FRA F-6180-49A) which reads "Do Not Use After: mm/dd/yy". Verify that the locomotive has not passed this date.

A. Record of Previous Inspection

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, following this procedure:

1. If your tour of duty will go beyond 2359, you must perform the locomotive daily inspection prior to 2359.

Contact the train dispatcher, yardmaster, or other proper authority to determine the location for completing the daily inspection.

or

2. If you have time to reach your final terminal before 2359, you should make the inspection at that terminal unless instructed by the proper authority that the inspection will be made prior to 2359 by:
The Mechanical Department

Or

The relieving engineman

B. No Record of Previous Inspection

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.

C. Locomotive Picked Up on Line

When picking up a locomotive on line, the engineer must determine if a daily inspection is needed. After pick up, if working trailing units have an earlier date than the lead unit, tag the lead unit "Trailing units due

inspection by 2359 (current date) ."

If inspection is needed and the unit:

1. Will be used as a working locomotive—inspect.
or
2. Is idling or shutdown and will not be used as a working unit:
 - a. If used anytime this calendar day—inspect.
or
 - b. If known that it has not been used this calendar day—do not inspect.

D. Locomotive Set Out on Line

When setting out a unit on line, determine if a daily inspection is needed. If an inspection is needed, make the inspection unless it will be made prior to 2359 by:

The Mechanical Department
or
The engineman picking up on line

Contact the train dispatcher or yardmaster to determine if the inspection will be made by others.

30.8.3 Inspection Requirements

Inspection requirements apply to each unit. However, locomotives 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 or Note 3.

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
 - c. As high as 140 psi if foreign line locomotive is in consist
3. Brake Pipe Pressure is:
 - a. Freight trains—90 psi
 - b. Passenger trains with a UP locomotive as the controlling unit—105 psi
 - c. Passenger trains with an Amtrak locomotive as the controlling unit— 110 psi
 - d. Yard engines handling:

Freight cars—90 psi
Passenger cars—105 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 (See Rule 30.8.4 A., Notes 1 or 2):

Headlight: A minimum of one headlight bulb must be on each end of the unit.(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 newer locomotives in order to check sanders, close the generator field switch ("On"), place the reverser in the forward or reverse position, and put the throttle in Run 1. Leave the sander on about twenty seconds then return the throttle to idle, open the generator field switch ("Off"), and remove the reverser before leaving the cab. On the walkaround on the ground, check to see that sand is deposited. If no sand is present, repeat the process.

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 non-complying 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. However, on General Electric locomotives equipped with alternating current (a/c) traction motors, one or more traction motors may be 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.

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, hand holds, steps, ladders, safety chains, and guards are secured and ready for service. Inspect for broken, bent, damaged, or loose equipment. Safety chains 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 an environmental problem as a defect and not as a 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

Note: 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, or 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 1/2 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 overhangs on the shoe 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 a multi-unit cable holder.

10. Manually drain oil and water from main reservoirs. If equipped with automatic drains, ensure the valve handles are then turned fully clockwise to the automatic position, with the stem extending beyond the valve handle.

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.

30.8.4 Inspection Complete

A. Daily Locomotive Inspection Report

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

1. Leave the completed Locomotive Inspection Report with each unit inspected, unless otherwise instructed.
2. Immediately report any non-complying conditions to the train dispatcher, yardmaster, or other 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 or 3.

Note 1: A minimum of one headlight bulb must work 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 Form 25005.

Note 2: Units with these defects may be used for power as trailing units. Enter the defects on Form 25005.

NOTE 3: UNITS WITH SUCH DAMAGE SHOULD BE REPORTED, BUT IT DOES NOT CONSTITUTE A NON-COMPLYING DEFECT.

B. Inspection Record Card

Complete the Inspection Record Card on each unit inspected.

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CHANGE RULE 30.8.4, SECOND PARAGRAPH OF PART A (DAILY LOCOMOTIVE INSPECTION REPORT) TO READ:

NON-COMPLYING CONDITIONS FOUND DURING THE DAILY INSPECTION MUST BE CORRECTED BEFORE THE UNIT IS PLACED IN SERVICE, UNLESS RELIEVED BY NOTES 1, 2 OR 3.

ADD TO RULE 30.8.4 A (DAILY LOCOMOTIVE INSPECTION REPORT) A NEW NOTE 3 TO READ:

NOTE 3: UNITS WITH SUCH DAMAGE SHOULD BE REPORTED, BUT IT DOES NOT CONSTITUTE A NON-COMPLYING DEFECT.

11. THERE IS NO APPARENT PHYSICAL DAMAGE TO THE ATC/ACS RECEIVER BARS ON LOCOMOTIVES EQUIPED WITH ATC/ACS. THESE BARS ARE LOCATED ABOVE THE RAIL AND IN FRONT OF THE WHEELS. THIS REQUIREMENT APPLIES ONLY TO LEAD LOCOMOTIVES ON TRAINS OPERATING IN ATC/ACS TERRITORY. (SEE NOTE 3)

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Change paragraph C, step 10 to read as follows:

10. Manually drain oil and water from main reservoirs. If equipped with automatic drains, ensure the valve handles are then turned fully clockwise to the automatic position, with the stem extending beyond the valve handle.

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CHANGE RULE 30.8.3, SECOND PARAGRAPH TO READ:

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, NOTE 2, OR NOTE 3.

ADD TO RULE 30.8.3 C (GROUND INSPECTION) A NEW STEP 11 TO READ:

11. THERE IS NO APPARENT PHYSICAL DAMAGE TO THE ATC/ACS RECEIVER BARS ON LOCOMOTIVES EQUIPED WITH ATC/ACS. THESE BARS ARE LOCATED ABOVE THE RAIL AND IN FRONT OF THE WHEELS. THIS REQUIREMENT APPLIES ONLY TO LEAD LOCOMOTIVES ON TRAINS OPERATING IN ATC/ACS TERRITORY. (SEE NOTE 3)

30.8.5 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 train dispatcher, yardmaster, or other 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.

In addition, the following must occur:

1. A non-complying locomotive tag must be completed and attached to the isolation switch of the non-complying locomotive. The tag must include the following information:

"Non-complying locomotive" written on the tag

Locomotive initials and number

Name of the inspecting railroad

Inspection location and date

Nature of the defect

Movement restrictions, if any

Destination

Signature of the employee making the inspection

Secure a copy of the tag on the control console of the controlling locomotive.

2. When the outside temperature is expected to:

Drop below 40 degrees F, the unit must be left idling.

or

Stay at or above 40 degrees F, the unit must be shut down as outlined in Rule 31.1.7 (Diesel Engine Shutdown).

3. The engineer in charge of movement of the locomotive must receive written notification of the non-complying locomotive (a copy of a non-complying locomotive tag meets this requirement). The engineer must inform all other crew members of the non-complying unit and of any restrictions.

4. A non-complying unit required to be isolated or shut down in consist may not continue as the controlling or lead unit of a locomotive consist.

30.8.6 Locomotive Not Safe to Move

If the employee determines the locomotive is not safe to move, notify the train dispatcher, yardmaster, or other proper authority. In addition, complete a non-complying tag and attach the tag to the isolation switch of the non-complying locomotive. The tag must include the following information:

"Non-complying locomotive" written on the tag
Locomotive initials and number
Name of the inspecting railroad
Inspection location and date
Nature of the defect
Signature of the employee making the inspection

30.9 Conditions Found Enroute

30.9.1 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 Inspection Report. Leave the report on the controlling unit of the consist.

The engineer must report any defects or problems to the train dispatcher, yardmaster, or other 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.

30.9.2 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 30.8.5 (Locomotive Safe to Move), steps 1 and 3. 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 Inspection Report.

Leave the completed Locomotive Inspection Report with the non-complying locomotive unless otherwise instructed.

Report non-complying conditions to the train dispatcher 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 30.8.3 (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, or more than 5 MPH plus or minus above 30 MPH.

— While moving, crew members detect flat spots. Inspection determines that one or more flat spots are 2-1/2 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.

30.10 Requirements for 2-Way EOT or Equivalent Device

References in the 30.10-series of rules to Chart 1 and Chart 2 refer to grade reference charts contained in the timetable or special instructions Item 4-B and Item 4-C.

The following trains must be equipped with operable 2-way end-of-train telemetry device (rear-end unit and head-end unit) or equivalent device:

Trains exceeding 30 MPH on any territory.
Trains operating on specified grades listed on Chart 1.

or

Trains departing from a designated crew change location for that train, if entering territory listed on Chart 2.

Exception: The following trains do not require a 2-way EOT or equivalent device:

Passenger trains.

Local trains not exceeding 4000 trailing tons, operating within a single designated crew district, and not operating over a section of track listed in Chart 1.

Work trains not exceeding 4000 trailing tons and not operating over a section of track listed in Chart 1.

Equivalent devices which meet this requirement include:

Occupied caboose.

Helper locomotive.

Distributed Power locomotive.

30.10.1 Using 2-Way EOT Device When Required

When required to use a 2-way EOT device to comply with Rule 30.10, the following applies:

A. The device must be armed and capable of initiating an emergency application of the brakes.

B. The EOT batteries must be sufficiently charged before leaving the trains' initial terminal to ensure that the device will remain operative to a location where batteries can be replaced. A reading of C0 to C10 charged units satisfies this requirement. The train must not depart designated crew change points for that train when any of these indications are displayed by the head-end unit (HEU):

"DEAD BAT"

"REPL BAT"

"BATTERY LOW"

30.10.2 Using Equivalent Device When Required

When using an equivalent device to comply with Rule 30.10, the following applies:

A. Occupied Caboose:

1. Must be located at end of train.
2. Must be equipped with emergency brake valve. Valve must be tested where caboose is added to train.
3. Occupant must have radio communication with lead engineer.
4. Just prior to passing the crest and while on a grade listed in Chart 1, the caboose will verify and maintain communication with the lead engineer.

B. Helper Locomotive:

1. Must be located at the rear in the rear third of train.
2. Helper engineer must have radio communication with lead engineer.
3. Just prior to passing the crest and while on a grade listed in Chart 1, the helper engineer will verify and maintain communication with the lead engineer.

C. Distributed Power Locomotive:

1. Must be located at the rear in the rear third of train.
2. Must be controlled by engineer in the lead DP locomotive.

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CHANGE Rule 30.10.2 (Using Equivalent Device When Required),

Parts B.1. and C.1. to read as follows:

1. Must be located at the rear of train.

30.10.3 Failure of 2-Way EOT or Equivalent Device

A. 2-way EOT failure will be indicated by any of the following conditions displayed by the head-end unit (HEU):

"DEAD BAT"

"FR NOCOM"

"VALVE FAIL"

"EMERG DISABLED"

"NOT ARMED"

B. Equivalent device failure will be indicated by:

Loss of radio communication exceeding 16 min. 30 sec. between the controlling locomotive and occupied caboose or manned helper, such that a request for emergency braking cannot be communicated to the caboose or helper.

Loss of radio communication exceeding 16 min. 30 sec., such that an emergency brake command cannot be sent by the leading Distributed Power consist or received by the DP locomotive(s) in rear third of train.

C. When EOT or equivalent device fails as indicated above, take the following action:

1. Failure must be reported immediately to the train dispatcher.
2. Train must not exceed 30 MPH until the ability of the device to initiate an emergency brake application from the rear third of the train is restored.
3. When failure occurs just prior to passing the crest of a grade listed in Chart 1, or while on the grade; if the train is under control, stop at the next siding or crossover where trains may pass, otherwise stop immediately. The train must remain stopped until the ability of the device to initiate an emergency brake application is restored or functioning equivalent device is added.
4. In all cases when operating on grades listed in Chart 1, if train speed reaches 5 MPH above the authorized speed, the person occupying the caboose or the helper crew must stop the train immediately using an emergency brake application.

30.10.4 Inspection and Testing of End-of-Train Devices

At the initial terminal and aAfter each installation of either the head-end unit or rear-end unit on a train and before the train departs:

- A. It must be determined that the identification code entered into the head-end unit is identical to that on the rear-end unit.
- B. After charging the train, the EOT pressure reading displayed in the locomotive (HEU) must be compared with that on the rear-end unit (REU). The EOT device shall not be used if the difference between the two readings exceeds three pounds.
- C. The 2-way EOT device shall be tested to ensure that the device is capable of initiating an emergency brake application from the rear of the train. If this test is conducted by a person other than a member of the train crew, the engineer must be informed of the test results.
- D. Test Method:
 - 1. Attach and arm the 2-way EOT on the rear car.
 - 2. Turn angle cock between the car and EOT.
 - 3. Transmit an emergency brake application signal with controlling locomotive. If the EOT valve opens and vents the EOT pressure, the test is successful.

E. ENGINEER NOTIFICATION

IF THIS TEST IS CONDUCTED WITHOUT A MEMBER OF THE TRAIN CREW PRESENT, THE LOCOMOTIVE ENGINEER MUST RECEIVE WRITTEN NOTIFICATION THAT A SUCCESSFUL TEST WAS PERFORMED. THE NOTIFICATION SHALL INCLUDE THE DATE AND TIME OF THE TEST, THE LOCATION WHERE THE TEST WAS PERFORMED, AND THE NAME OF THE PERSON CONDUCTING THE TEST. THE NOTIFICATION SHALL BE LEFT IN THE CAB OF THE CONTROLLING LOCOMOTIVE FOR THE RELIEVING ENGINEER AT CREW CHANGE LOCATIONS. HOWEVER, THE RELIEVING ENGINEER IS NOT REQUIRED TO HAVE WRITTEN NOTIFICATION BEFORE DEPARTING.

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CHANGE RULE 30.10.4 (INSPECTION AND TESTING OF END-OF-TRAIN DEVICES) TO READ:
AT THE INITIAL TERMINAL AND AFTER EACH INSTALLATION OF EITHER THE HEAD-END UNIT OR REAR-END UNIT ON A TRAIN:

- A. IT MUST BE DETERMINED THAT THE IDENTIFICATION CODE ENTERED INTO THE HEAD-END UNIT IS IDENTICAL TO THAT ON THE REAR-END UNIT.
- B. AFTER CHARGING THE TRAIN, THE EOT PRESSURE READING DISPLAYED IN THE LOCOMOTIVE (HEU) MUST BE COMPARED WITH THAT ON THE REAR-END UNIT (REU). THE EOT DEVICE SHALL NOT BE USED IF THE DIFFERENCE BETWEEN THE TWO READINGS EXCEEDS THREE POUNDS.
- C. THE 2-WAY EOT DEVICE SHALL BE TESTED TO ENSURE THAT THE DEVICE IS CAPABLE OF INITIATING AN EMERGENCY BRAKE APPLICATION FROM THE REAR OF THE TRAIN. IF THIS TEST IS CONDUCTED BY A PERSON OTHER THAN A MEMBER OF THE TRAIN CREW, THE ENGINEER MUST BE INFORMED OF THE TEST RESULTS.
- D. TEST METHOD:
 - 1. ATTACH AND ARM THE 2-WAY EOT ON THE REAR CAR.
 - 2. TURN ANGLE COCK BETWEEN THE CAR AND EOT.
 - 3. TRANSMIT AN EMERGENCY BRAKE APPLICATION SIGNAL WITH CONTROLLING LOCOMOTIVE. IF THE EOT VALVE OPENS AND VENTS THE EOT PRESSURE, THE TEST IS SUCCESSFUL.
- E. ENGINEER NOTIFICATION
IF THIS TEST IS CONDUCTED WITHOUT A MEMBER OF THE TRAIN CREW PRESENT, THE LOCOMOTIVE ENGINEER MUST RECEIVE WRITTEN NOTIFICATION THAT A SUCCESSFUL TEST WAS PERFORMED. THE NOTIFICATION SHALL INCLUDE THE DATE AND TIME OF THE TEST, THE LOCATION WHERE THE TEST WAS PERFORMED, AND THE NAME OF THE PERSON CONDUCTING THE TEST. THE NOTIFICATION SHALL BE

LEFT IN THE CAB OF THE CONTROLLING LOCOMOTIVE FOR THE RELIEVING ENGINEER AT CREW CHANGE LOCATIONS. HOWEVER, THE RELIEVING ENGINEER IS NOT REQUIRED TO HAVE WRITTEN NOTIFICATION BEFORE DEPARTING.

30.10.5 Disarming the 2-Way EOT

The 2-way EOT must be disarmed under these circumstances:

Train arrives at the final terminal or destination.

or

Controlling locomotive, head end unit (HEU), or EOT are changed for any reason.

31.0 TRAIN OPERATION AND TRAIN HANDLING RULES

31.1 Locomotives, Cars, or Train Standing

31.1.1 Equipment Unattended

31.1.2 Locomotive Unattended

31.1.3 Stopped on a Grade

31.1.4 Setting Out Cars on Grades

31.1.5 Prevent Motor from Burning

31.1.6 Low Idle

31.1.7 Diesel Engine Shutdown

31.1.8 Prevent Wheels Sliding

31.1.9 Separate Locomotive Units

31.2 Changing Operating Ends

31.2.1 Nullify Operating Controls

31.2.2 Restore Operating Controls

31.2.3 Operating from the Lead Controlling Unit

31.3 Starting Trains

31.3.1 Uniform Speed

31.3.2 Verifying Brake Pipe Continuity

31.4 Controlling the Speed of, Slowing, and Stopping Trains

31.4.1 Controlling Speed

31.4.2 Stopping Trains

31.4.3 Disturbed Track

31.4.4 Throttle/Dynamic Brake Adjustments

31.5 Dynamic Braking

31.5.1 Operating Dynamic Brake Correctly

31.5.2 Through Turnout or Crossover

31.5.3 Supplementing Dynamic Brake

31.5.4 Locomotive Brake

31.5.5 Stopping While in Dynamic Braking

31.5.6 Continuous Dynamic Braking

31.5.7 Isolating a Unit 31-21

31.5.8 Dynamic Brake Warning Light

31.6 Grade Braking

31.6.1 Pressure Maintaining Braking

31.6.2 Application and Release Braking

31.6.3 Maintaining Speed

31.7 Retaining Valves

31.7.1 Locations Designated by Timetable or General Order

31.7.2 Locations Not Designated

31.7.3 Maximum Speed During Retaining Valve Use

31.7.4 Retaining Valve Positions

31.7.5 When Wheels Overheat

31.7.6 No Longer Required

31.8 Helper Service

31.8.1 Using More than One Locomotive Consist

- 31.8.2 Helper Placement
- 31.8.3 Helper Cut Into or at Rear of Train
- 31.8.4 Helper at Head End of Train
- 31.9 Emergency and Other than Normal Stops
 - 31.9.1 Use of All Available Braking Power
 - 31.9.2 Emergency Application
 - 31.9.3 Train Break-In-Two
 - 31.9.4 Unknown Service Application
- 31.10 Penalty Brake Applications
 - 31.10.1 Automatic Full Service Application
 - 31.10.2 Controlling Unit Dies Enroute
 - 31.10.3 Train Stopped After Penalty Application
- 31.11 Running Backwards
- 31.12 Defective Brakes and Equipment
 - 31.12.1 Operative Air Brakes
 - 31.12.2 Cutting Out Brakes
 - 31.12.3 Total Air Brake Failure Enroute
 - 31.12.4 Air Hoses Separate or Cars Uncouple Enroute
- 31.13 Handling Shutdown or Isolated Locomotives
 - 31.13.1 Inspection Requirements
 - 31.13.2 Locomotives Equipped for Multiple-Unit Operation
 - 31.13.3 Locomotives Not Equipped for Multiple-Unit Operation
 - 31.13.4 Units Isolated, Shutdown, or Failed Enroute

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 (Locomotive Unattended).

B. Cars Unattended

Secure cars to be left unattended as described in Rule 31.1.4 (Setting Out Cars on Grades).

The Following 3-Unit Articulated Double Stack Well Cars Must Be Left Attached To Other Cars Having Hand Brakes Applied When Spotted At Intermodal Facilities Or When Set Out:

BNSF 211333-211400 And DTTX 725157-725267

(Explanation: These Cars Have Potential Insufficient Hand Brake Force Until Modifications Are Made)

C. Trains Unattended for Short Duration

When leaving trains standing unattended where the crew has determined that equipment will not move with all brakes released, or when at a terminal crew change location and informed that the train will be unattended less than 1 hour, complete the following procedure:

1. After slack is adjusted, apply enough hand brakes on the head end to hold the train.
2. Secure locomotives as described in Rule 31.1.2 (Locomotives Unattended).

D. Trains Unattended for Indefinite Duration or Unattended at Other than a Terminal Crew Change Location

When it is not known that the train will be attended within 1 hour at a terminal crew change location, or at other locations where trains might move with the brakes released, complete the following procedure:

1. Apply enough hand brakes on the low end to hold the train with the air brakes released.
2. Place the retaining valves, if in use, in the EXHAUST position.
3. Close slack in against cars that have hand brakes applied, by releasing the automatic and independent brakes.

4. After the slack has closed in and all movement has stopped, secure locomotives as described in Rule 31.1.2 (Locomotive Unattended).

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Add To Rule 31.1.1 B.(Cars Unattended):

The Following 3-Unit Articulated Double Stack Well Cars Must Be Left Attached To Other Cars Having Hand Brakes Applied When Spotted At Intermodal Facilities Or When Set Out:

BNSF 211333-211400 And DTTX 725157-725267

(Explanation: These Cars Have Potential Insufficient Hand Brake Force Until Modifications Are Made)

31.1.2 Locomotive Unattended

When possible, place locomotives that will be left unattended on a track protected by a derail.

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 lead 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. On units equipped with underslung brake cylinders (attached to brake levers between the wheels versus mounted on the truck), the brake cylinder must be cut out using the brake cylinder cutout cock, the hand brake fully tightened, and the brake cylinder cut back in. 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. Isolation switch is in the ISOLATION position on all units in the consist.
6. Engines are shut down if required
7. Electrical cable is properly stowed, or the disconnected end is placed into a dummy receptacle or multi-unit cable holder.
8. Windows are closed and latched.
9. Securement Checklist is completed, signed, and placed in the locomotive inspection report card holder, unless otherwise instructed.
10. Automatic brakes are applied with a 20 psi brake pipe reduction.
11. Locomotive cab doors are closed.
6. Windows are closed and latched.
7. Engines are shut down if required.
8. Electrical cable is properly stowed, or the disconnected end is placed into a dummy receptacle or multi-unit cable holder.

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SSI Item 10-C. 31.1.2 Locomotive Unattended

Delete steps 6 through 8

Add new steps 6 through 11 as follows:

6. Engines are shut down if required
7. Electrical cable is properly stowed, or the disconnected end is placed into a dummy receptacle or multi-unit cable holder.
8. Windows are closed and latched.
9. Securement Checklist is completed, signed, and placed in the locomotive inspection report card holder, unless otherwise instructed.
10. Automatic brakes are applied with a 20 psi brake pipe reduction.
11. Locomotive cab doors are closed.

31.1.3 Stopped on a Grade

When it is necessary to restore air brake pressure to a safe level before proceeding on a descending grade, and the independent brake (or, on an all-AC locomotive consist in power) may not hold the train, do not release the automatic brakes until enough hand brakes are applied to hold the train with the automatic brakes released. Then release the automatic brakes and recharge the system to a safe level.

Before proceeding, make an automatic brake application sufficient to hold the train and release the hand brakes.

31.1.4 Setting Out Cars on Grades

When cars are set out on grades, follow this procedure:

1. Place the retaining valves on the cars to be set out, if in use, in the EXHAUST position.
2. Apply enough hand brakes on the low end to hold the cars with the air brakes released.
3. Close in slack on the cars that will be left standing.
4. Detach to allow an emergency brake application on cars that will be left standing.
5. On heavy grades:
 - a. Further tighten each hand brake set.
 - b. Drain the brake cylinders.

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 unless all locomotive units in the consist are AC locomotives.

31.1.6 Low Idle

To conserve fuel while locomotives are standing, center the reverse lever (put in NEUTRAL).

31.1.7 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 local supervisors as follows:

In yards.

At designated locomotive servicing and repair areas.

On Locals and Road Switchers when left at the normal tie-up point.

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 train dispatcher or yardmaster of this fact before leaving the locomotive unattended. If the lead unit is not running, leave one trailing unit running.

Contact the train dispatcher, yardmaster, or other 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 air conditioning, 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.

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, then open 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, and low water and crankcase protective devices are in the NORMAL or RESET position.
3. On GE units, push the fuel pump reset button, if required.
4. Check that switches or breakers for air conditioning, lights, heaters, refrigerator, and other accessories are in the OFF position.
5. Ensure that the fuel pump breaker is ON.
6. Check that the fuel pump (engine run) and control switches on the engineer's control console are ON.
7. Make sure the engine control switch (isolation switch) is in the START/STOP/ISOLATE position.

8. Close the main battery switch.
9. 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.
10. 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).
11. Crank the engine, not longer than 20 seconds, until the engine starts (crank GE engines for 45 seconds). 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.
12. Place switches or breakers for air conditioning, lights, heaters, refrigerator, and other accessories in the ON position, as appropriate.
13. Check that the air brake system is charged and operative before releasing the hand brake.
14. 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.

31.1.8 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.

31.1.9 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.

31.2 Changing Operating Ends

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

When changing operating ends of a suburban train, an application and release brake test must be performed on the rear car/engine.

31.2.1 Nullify Operating Controls

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

1. Levers

- a. Put the throttle in IDLE.
- b. Place the reverse lever in NEUTRAL and remove the handle.

2. Brake equipment

- a. Fully apply the independent brake.
- b. Make a 20 pound brake pipe reduction.
- c. Place the dual-ported or MU cutout cock in the TRAIL/TRAIL 24 position. However, leave it in the LEAD position when changing operating ends on commuter trains to operate from the Cab Car. Then place the brake valve cutoff valve in the OUT position
or
Set the air brake system to TRAIL/CUTOFF (GE) or TRAIL (EMD) on electronic equipment.
- d. Place the independent brake valve handle in the RELEASE position.
- e. Place the automatic brake valve handle in the HANDLE OFF position.

2. Independent brake equipment

- a. Fully apply the independent brake.
- b. Place the dual-ported or MU cutout cock in the TRAIL/TRAIL 24 position. However, leave it in the LEAD position when changing operating ends on commuter trains to operate from the Cab Car.
- c. Place the independent brake valve handle in the RELEASE position.

3. Switches

Place the generator field switch OFF.

3. Automatic brake equipment

- a. Make a 20 pound brake pipe reduction.
- b. Place the brake valve cutoff valve in the OUT position.
- c. Place the automatic brake valve handle in the HANDLE OFF position.

4. EOT equipment (if used)

Set the five digit ID Code setting on the EOT cab display to 00001 or 00002.

4. Switches

- a. Place the generator field switch OFF.

5. EOT equipment (if used)

- a. Set the five digit ID Code setting on the EOT cab display to 00000.

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SSI Item 10-C. 31.2.1 Nullify Operating Controls

CHANGE Rule 31.2.1, Nullify Operating Controls, to read:

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

1. Levers

- a. Put the throttle in IDLE.
- b. Place the reverse lever in NEUTRAL and remove the handle.

2. Brake equipment

- a. Fully apply the independent brake.
- b. Make a 20 pound brake pipe reduction.
- c. Place the dual-ported or MU cutout cock in the TRAIL/TRAIL 24 position. However, leave it in the LEAD position when changing operating ends on commuter trains to operate from the Cab Car. Then place the brake valve cutoff valve in the OUT position

or

Set the air brake system to TRAIL/CUTOUT (GE) or TRAIL (EMD) on electronic equipment.

- d. Place the independent brake valve handle in the RELEASE position.
- e. Place the automatic brake valve handle in the HANDLE OFF position.

3. Switches

Place the generator field switch OFF.

4. EOT equipment (if used)

Set the five digit ID Code setting on the EOT cab display to 00001 or 00002.

31.2.2 Restore Operating Controls

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

1. Replace the reverse lever.

1. Independent brake equipment

- a. Place the independent brake valve handle in the full application position.

- b. Place the dual-ported or MU cutout cock in the LEAD position.

or

Set the air brake system to LEAD/CUTOUT on electronic equipment.

2. Independent brake equipment

- a. Place the independent brake valve handle in the full application position.
- b. Place the dual-ported or MU cutout cock in the LEAD position.

2. 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.

or

Set the air brake system to LEAD/CUTIN on electronic equipment.

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.

3. Replace the reverse lever.

4. Switches

- a. Place the generator field switch ON.
- b. Place the control switch ON.
- c. Place the fuel pump (engine run) switch ON.

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 test as specified in Rule 30.3.3 (Procedure for Inspection and Test of Locomotive Brakes).

6. EOT equipment (if used)

- a. Set the five digit ID Code setting on the EOT cab display to match the ID Code on the rear unit.
- b. On a 2-way EOT device, arm (emergency enable) the device by pressing the Test pushbutton on the rear-end unit. When the "Arm Now" message is displayed on the head-end unit, press the Communication Test/Arm pushbutton. The "Emerg Enabled" status light will be displayed.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.2.2 Restore Operating Controls

CHANGE Rule 31.2.2, Restore Operating Controls, to read:

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

1. Independent brake equipment

- a. Place the independent brake valve handle in the full application position.
- b. Place the dual-ported or MU cutout cock in the LEAD position.

or

Set the air brake system to LEAD/CUTOFF on electronic equipment.

2. 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.

or

Set the air brake system to LEAD/CUTIN on electronic equipment.

3. Replace the reverse lever.

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 test as specified in Rule 30.3.3 (Procedure for Inspection and Test of Locomotive Brakes).

6. EOT equipment (if used)

- a. Set the five digit ID Code setting on the EOT cab display to match the ID Code on the rear unit.
- b. On a 2-way EOT device, arm (emergency enable) the device by pressing the Test button on the rear-end unit. When the "Arm Now" message is displayed on the head-end unit, press the Communication Test/Arm pushbutton. The "Emerg Enabled" status light will be displayed.

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.

Do not operate 'B' units as the lead unit except when hostling.

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.

A. Descending Grades

On descending grades, use the independent brake to keep the locomotive speed slow and uniform until the entire train is moving.

B. Ascending Grades

On ascending grades, if the train will start with a steady pull, increase the throttle gradually as train speed increases.

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, except when using retaining valves or at locations where train brakes will have to be reapplied shortly, such as on heavy descending grades. 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 (unless due to grade conditions the recommended train handling practice is to start the train with brakes remaining applied) and observe an increase in brake pipe pressure on the EOT device prior to moving the train.

or

If operating with a distributed power consist that is equipped with the automatic Train Check feature, use it to verify brake pipe continuity.

If not equipped with the Train Check feature, cut out the brake valve on the controlling DP unit of each remote consist, make a 10 pound brake pipe reduction, restore each remote consist to "Normal," then release the brakes and observe an increase in brake pipe pressure on the rear remote consist or EOT, whichever is at the rear of the train.

The relieving crew must perform this test on distributed power consists at crew change locations, regardless of advice from the crew relieved that the test was performed.

If the train is not equipped with an operative EOT device or when an EOT communication failure has occurred, observe horsepower requirements when starting. If excessive tractive effort is needed (based on existing conditions) to start the train, inspect the train to determine the cause.

31.4 Controlling the Speed of, Slowing, and Stopping Trains

31.4.1 Controlling Speed

A. On Freight Trains

On freight trains, the preferred methods to control speed are throttle modulation and dynamic braking.

If neither method is 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, except when using retaining valves or at locations where train brakes will have to be reapplied shortly.

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 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.

D. On Passenger Trains

On passenger trains, reduce speed as follows:

1. Reduce the throttle to Run 4 or lower before making an initial brake pipe reduction.
2. Reduce the throttle further as speed decreases, if grade conditions permit.
3. Keep the locomotive brakes released during the initial brake pipe reduction, and apply the brakes gradually during succeeding brake pipe reductions to prevent wheels from sliding.
4. If the passenger train is equipped with operative blended braking, use it as follows:
 - a. Make sure the dynamic brake is operative.
 - b. Place the throttle in IDLE.

c. Make sure the automatic brake valve is in the service zone, the independent brake is not actuated, and speed is above 5 MPH.

31.4.2 Stopping Trains

A. Stopping Freight Trains

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

1. Close the throttle. However, on heavy ascending grades, reduce the throttle until the train stalls to keep slack stretched, and then 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, except when using retaining valves or at locations where the train brakes will have to be reapplied shortly, such as on heavy descending grades.

B. Stopping Passenger Trains

Stop passenger trains as follows:

1. Place the throttle in IDLE before stopping.
2. Stop with the lightest possible brake pipe reduction, but do not stop using only the locomotive brake.

31.4.3 Disturbed Track

When track work has affected track stability, a track bulletin or other instruction may be issued by the proper authority stating that, between certain limits, engineers must handle their trains according to Rule 31.4.3 (Disturbed Track).

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

Use throttle modulation or low dynamic brake amperage.

Avoid making slack adjustments.

Avoid applying or releasing automatic brakes.

Make power and brake adjustments before or after the restriction.

If Operating With Distributed Power At The Rear Of The Train On:

- Level or ascending grades, operate in synchronous mode with low throttle settings or operate in independent mode with distributed power 1-3 throttle positions below the lead consist.
- Descending grades, operate in synchronous mode with low dynamic brake settings or operate in independent mode with distributed power 1-3 dynamic brake positions above the lead consist.

General Order No. 27 December 17, 2001

Add To Rule 31.4.3, New 5th Bullet Reading:

If Operating With Distributed Power At The Rear Of The Train On:

- Level or ascending grades, operate in synchronous mode with low throttle settings or operate in independent mode with distributed power 1-3 throttle positions below the lead consist.
- Descending grades, operate in synchronous mode with low dynamic brake settings or operate in independent mode with distributed power 1-3 dynamic brake positions above the lead consist.

31.4.4 Throttle/Dynamic Brake

Gradually change the throttle/dynamic brake lever to allow the slack to adjust slowly. Monitor the amperage closely when making these changes.

31.5 Dynamic Braking

31.5.1 Operating Dynamic Brake Correctly

Engineers must plan far enough in advance before using the dynamic brake so they can operate control levers gradually and allow slack to bunch gradually. Engineers must operate the dynamic brake gradually to prevent excessive current surges, damage to locomotive equipment, and rough train handling.

Engineers using dynamic brakes must follow these requirements:

Make sure operative dynamic brakes in a locomotive consist do not exceed a total of 28 axles. If any locomotive consist exceeds this requirement, the engineer must:

—Cut out the dynamic brake function by turning OFF the dynamic brake cutout switch located on the engine control panel on enough trailing units to comply with this requirement.

—Make sure the dynamic brake circuit breaker on the engineer's control stand of the controlling unit is ON.

When determining total axles of dynamic brake on a locomotive consist, use Special Instruction Item 4 [Locomotive Table].

A. Dual Handle Control Stands

On locomotives with dual handle control stands:

Wait 10 seconds before moving the dynamic brake handle from OFF to SET-UP, and wait 10 seconds before moving from SET-UP into the braking zone.

When going from dynamic braking to power operation, wait 10 seconds before moving the dynamic brake handle from SET-UP to OFF, and wait 10 seconds before moving the throttle from IDLE to throttle 1.

B. Single Handle Control Stands

On locomotives with single handle control stands:

Wait 10 seconds before moving the selector lever from POWER to OFF, and wait 10 seconds before moving from OFF to B.

When going to power operation from dynamic braking, wait 10 seconds before moving the selector lever from B to OFF, and wait 10 seconds before moving the selector lever from OFF to POWER.

31.5.2 Through Turnout or Crossover

When handling freight trains with more than 16 dynamic brake axles and with light loads or empties on the head end and heavy loads behind:

Do not use more than 500 amps (or 40 KLBS Force) of dynamic braking while the head-end cars are passing through the turnout or crossover when speed is 30 MPH or less.

Control the train speed by applying the air brakes as necessary.

Do not use the maximum dynamic brake until after all of the head-end cars have passed through the turnout or crossover.

General Order No 27 December 17, 2001

Change Rule 31.5.2, 1st Bullet, To Read:

* Do not use more than 500 AMPS (OR 40 KLBS FORCE) of dynamic braking while the head-end cars are passing through the turnout or crossover when speed is 30 MPH or less.

31.5.3 Supplementing Dynamic Brake

Supplement the dynamic brake by using the train air brakes, if necessary, to control train speed properly. If possible, apply the air brakes to the extent that speed can be controlled by modulating the dynamic brake.

31.5.4 Locomotive Brake

Do not allow the locomotive brakes to apply when the dynamic brake is in use, except when starting the train or just before the train stops. Observe the brake cylinder gauge on the locomotive frequently to ensure that the locomotive brakes are kept released.

Do not depend on the dynamic brake interlock (DBI) to keep locomotive brakes released. Actuate the locomotive brakes when applying the train brakes during dynamic braking.

31.5.5 Stopping While in Dynamic Braking

When stopping freight trains while in dynamic braking, apply the independent brake slowly just before the train stops to prevent slack from running out. Move the dynamic brake operating lever to the OFF position after the train stops.

31.5.6 Continuous Dynamic Braking

All Union Pacific locomotives equipped with dynamic brakes have been modified to provide continuous dynamic braking. This prevents a runout or possible break-in-two if the dynamic brake is lost during an emergency or during a penalty application of the train brakes. Maintaining dynamic braking in a consist depends on the controlling unit having this modification.

31.5.7 Isolating a Unit

When a unit in the consist will be isolated, the unit must be out of dynamic braking before being isolated. Do not put an isolated unit on line while the consist is in dynamic braking.

31.5.8 Dynamic Brake Warning Light

If the dynamic brake warning light blinks on and off while the dynamic brakes are operating, reduce the braking force. If the condition continues, cut out the dynamic brake on the affected unit or discontinue use of dynamic braking.

Immediate Warning Light or Buzzer

If the dynamic brake warning light comes on or a buzzer sounds immediately after placing the selector lever or dynamic brake handle in the braking zone, remove the lever from the braking zone, and do not use the dynamic brake.

31.6 Grade Braking

31.6.1 Pressure Maintaining Braking

When using the pressure maintaining method of braking, do not make the reductions so heavy that the brakes would have to be released. If the first reduction does not hold the train, make further brake pipe reductions of 2 pounds each until the train holds at the desired speed.

When using the pressure maintaining method of braking, do not make the reductions so heavy that the brakes would have to be released. If the first reduction does not hold the train, make further brake pipe reductions of 1 or 2 pounds each until the train holds at the desired speed.

Do not use pressure maintaining braking for extended periods at speeds exceeding 30 MPH. Otherwise, wheels and brake shoes will be damaged. Use the application and release method of braking at speeds exceeding 30 MPH. Reduce speed enough before releasing the brakes to ensure that the wheels can cool and the brake pipe can recharge before it is necessary to apply the brakes again.

Equalizing Reservoir Leak

When using the pressure maintaining method of braking for extended periods, engineers may observe a drop in pressure on the Equalizing Reservoir Pressure gauge. This indicates an equalizing reservoir leak, which causes a heavier brake application than desired. Only if an equalizing reservoir leak occurs, follow these steps to avoid an undesired release of the train brakes:

1. If it is safe to operate with train brakes released, place the automatic brake valve handle in the Release position.

Note: If it is not safe to operate with train brakes released at that location, stop and secure the train before placing the automatic brake valve handle in the Release position.

2. Place the brake valve cutoff valve in the Passenger position, if equipped.

When operating in the PASSENGER position, use extreme care. Any slight movement of the brake valve handle toward the RELEASE position will cause the automatic brakes to release completely throughout the train.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.6.1 Pressure Maintaining Braking

Change first paragraph to read:

When using the pressure maintaining method of braking, do not make the reductions so heavy that the brakes would have to be released. If the first reduction does not hold the train, make further brake pipe reductions of 2 pounds each until the train holds at the desired speed.

31.6.2 Application and Release Braking

If neither dynamic braking nor pressure maintaining braking is practical, use the application and release method of braking on descending grades as follows:

1. Start the first application at a point where speed will not become excessive as the train moves onto the grade.

2. Hold the application until speed reduces to less than the desired amount to ensure that when the brakes are released, the brake system can recharge before the train reaches excessive speed.

Succeeding Brake Applications

If succeeding brake applications are needed before the brake system fully recharges, the engineer must avoid an undesired release of the train brakes as follows:

1. Note the equalizing reservoir pressure at the moment the service exhaust starts to blow from the automatic brake valve.

2. Make the desired reduction below that reference pressure.

3. If the service exhaust cannot be heard, reduce brake pipe pressure at least 2 to 3 pounds below the previous reduction to ensure that the brakes apply and remain applied.

31.6.3 Maintaining Speed

If the amount of brake pipe reduction exceeds 18 pounds to maintain speed at any location, stop the train immediately, using the emergency position, if necessary. On trains using retaining valves, use the emergency position immediately. In either case, Then do the following:

1. Inspect the air brakes. If they are suitable for safe operation, recharge the brake pipe fully before proceeding.
2. If the train cannot be held with a fully applied independent brake, apply enough hand brakes to hold the train.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.6.3 Maintaining Speed

Change to read:

If the amount of brake pipe reduction exceeds 18 pounds to maintain speed at any location, stop the train immediately, using the emergency position. Then do the following:

1. Inspect the air brakes. If they are suitable for safe operation, recharge the brake pipe fully before proceeding.
2. If the train cannot be held with a fully applied independent brake, apply enough hand brakes to hold the train.

31.7 Retaining Valves

31.7.1 Locations Designated by Timetable or General Order

Locations where retaining valves must be used are designated by timetable or general order. When retaining valves must be used, they must be set and charged as explained below.

Setting Retaining Valves

At designated locations:

Stop the train and set the retaining valves as specified by the timetable or general order. If no quantity is specified, set all retaining valves.

1. Cars with an actual weight of 50 tons or less must have retainer set to low pressure position, if equipped, or slow direct position if not equipped.
2. Cars with an actual weight over 50 tons must have retainer set to high pressure position.

Notify the engineer of the number set before proceeding.

Charging Retaining Valves

When the retaining valves have been set, they:

Are not charged until an application and release has been made.

Are not fully charged until an application and release of at least 10 pounds has been made.

Further brake pipe reductions will add to the pressure in the brake cylinder.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.7.1 Locations Designated by Timetable or General Order
Change first bullet under "Setting Retaining Valves" to read:

Stop the train and set the retaining valves as specified by the timetable or general order. If no quantity is specified, set all retaining valves.

31.7.2 Locations Not Designated

At locations not designated by timetable or general order, use retaining valves where the conductor or engineer thinks they are needed to control the train properly. At these locations, stop the train, set the retaining valves in the HP position on the head end of the train on not less than 30 percent of the total train tonnage, and charge the retaining valves.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.7.2 Locations Not Designated

Changed to read:

At locations not designated by timetable or general order, use retaining valves where the conductor or engineer thinks they are needed to control the train properly. At these locations, stop the train, set the retaining valves in the HP position on the head end of the train on not less than 30 percent of the total train tonnage, and charge the retaining valves.

31.7.3 Maximum Speed During Retaining Valve Use

Do not exceed a speed of 15 MPH when retaining valves are set and charged.

31.7.4 Retaining Valve Positions

Retaining valves are equipped with three or four positions cast onto the valve.

Four Position Retainer:

1. The EXHAUST (EX) position is when the handle is in the vertical position. It provides direct exhaust of all brake cylinder pressure.
2. The HIGH PRESSURE (HP) position is when the handle is 45 degrees below horizontal. It provides slow exhaust of brake cylinder pressure to 20 pounds, and then holds brake cylinder pressure at 20 pounds.
3. Low Pressure (LP) position is when the handle is horizontal. It provides slow exhaust of the brake cylinder pressure to 10 pounds, and then holds brake cylinder pressure at 10 pounds.
4. Slow Direct (SD) position is when the handle is 45 degrees above horizontal. The flow of brake cylinder pressure is completely vented to atmosphere in approximately 86 seconds.

Three Position Retainer: The three position retainer does not have the Low Pressure (LP) position.

31.7.5 When Wheels Overheat

When retaining valves are in use, place the retaining valve in the EXHAUST position on any car with overheating wheels. Then, do the following:

1. Place retaining valves on an equal number of cars in the HIGH PRESSURE position if possible.
2. If all retaining valves in a train are being used and one or more valves need to be placed in the EXHAUST position, notify the engineer.
3. Tag each car having retaining valves that can no longer be used because of overheated wheels.

31.7.6 No Longer Required

When retaining valves are no longer required, stop the train and place all retaining valves in the EXHAUST position.

31.8 Helper Service

31.8.1 Using More than One Locomotive Consist

Comply with the following rules when more than one locomotive consist is used in a train, whether it is performing a helper service or temporarily assisting a stalled train.

A. Engineer Responsibilities

The engineer of the leading locomotive must operate the train brakes.

All other engineers will operate their locomotives under the direction of the lead engineer.

While handling a train with a helper, engineers must maintain communication with each other via radio at all times.

B. Conductor Responsibilities

The conductor must inform all helper engineers of the loads, empties, tons, and any restrictions for the train.

The conductor must also inform all engineers of the number of cars and tons that the helpers are cut in ahead of.

C. Increasing and Decreasing Throttle

When increasing or decreasing throttle, the helper engineer should, when possible, be two throttle notches above that of the lead engineer to control slack.

When starting trains, the helper engineer must open the throttle one notch at a time, keeping the amperage steady until the train is moving.

The helper engineer must keep a steady power output as speed increases.

The helper engineer should, when possible, be the first to work power after communicating with the engineer on the lead locomotive.

D. Operating in Light Power

When the lead engineer decides that helper power or the dynamic brake is not required to assist the train, the helper engineer should operate in light power, not to exceed throttle 2.

E. No Longer Required

When the helper is no longer required and will be detached from the train, stop the train before detaching the helper. After detaching the helper, crew members must not go between the helper and the train until the engineer informs them that the helper engine brakes are functioning properly.

31.8.2 Helper Placement

CHANGE RULE 31.8.2 IN ITS ENTIRETY TO READ:
RULE 31.8.2 HELPER PLACEMENT

THE TERM 'HELPER' AS USED IN THIS RULE REFERS TO EITHER A MANNED HELPER LOCOMOTIVE CONSIST OR A DISTRIBUTED POWER LOCOMOTIVE CONSIST NOT COUPLED TO THE LEAD/CONTROLLING CONSIST.

THE TERM 'EMPTY BULK COMMODITY UNIT TRAIN' AS USED IN THIS RULE APPLIES TO A TRAIN MADE UP ENTIRELY OF EMPTY CARS USED TO TRANSPORT COAL, GRAIN, ORE, POTASH, MOLTEN SULFUR, SODA ASH, PHOSPHATE ROCK, OIL, TACONITE OR OTHER BULK COMMODITIES.

THE TERM 'RESTRICTED TONNAGE LIMIT' REFERS TO THE TOTAL WEIGHT OF THE CARS IMMEDIATELY AHEAD OF THE HELPER. CERTAIN CARS ARE RESTRICTED FROM BEING WITHIN THAT TONNAGE LIMIT, TYPICALLY THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER.

A. REAR OR CUT-IN REQUIREMENT FOR HELPER
USE THE FOLLOWING APPLICABLE TABLE TO DETERMINE WHETHER A HELPER IS PLACED ON REAR OF TRAIN OR AT CUT-IN POSITION ON TRAIN.

LOADED BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

28 OR LESS

MAY BE PLACED ON REAR OR CUT-IN AS OUTLINED IN PART B BELOW. WHEN PLACED ON REAR, IT MUST BE PLACED AHEAD OF ANY CABOOSE.

29 TO 55

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.

EMPTY BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

16 OR LESS

MAY BE PLACED ON REAR OR CUT-IN AS OUTLINED IN PART B BELOW. WHEN PLACED ON REAR, IT MUST BE PLACED AHEAD OF ANY CABOOSE.

17 TO 32

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.
OTHER THAN A LOADED OR EMPTY BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

Any Helper

MUST BE PLACED AHEAD OF:

1. RAIL PICK-UP CARS RGAX 4694-4696;
2. TWO-AXLE SCALE TEST CARS;
3. CARS DESIGNATED 'REAR END ONLY' OR 'REAR RIDER';
4. OCCUPIED CABOOSE.
5. SINGLE PLATFORM TWO-AXLE CAR IN SERIES TTOX;
6. SOLID DRAWBAR-CONNECTED FOUR PLATFORM CAR IN SERIES TTFX;

7 OR LESS
PLACED ON REAR.

8 TO 16

PLACED ON REAR. THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO CARS AND/OR THE PLATFORM/WELLS OF MULTI-PLATFORM CARS ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR) WEIGHING LESS THAN 60 TONS.

WHEN TRAIN MAKEUP WITHIN THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER DOES NOT MEET THE ABOVE REQUIRMENTS, HELPER MAY BE CUT-IN TO TRAIN TO A LOCATION THAT DOES PERMIT COMPLYING WITH MAKEUP RESTRICTIONS. WHEN CUT-IN TO TRAIN UNDER THIS CONDITION, PART B BELOW WILL NOT APPLY.

17 TO 23

PLACED ON REAR. THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO CARS AND/OR THE PLATFORM/WELLS OF MULTI-PLATFORM CARS ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR)WEIGHING LESS THAN 60 TONS.
3. CAR WEIGHING LESS THAN 45 TONS;

WHEN TRAIN MAKEUP WITHIN THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER DOES NOT MEET THE ABOVE REQUIRMENTS, HELPER MAY BE CUT-IN TO TRAIN TO A LOCATION THAT DOES PERMIT COMPLYING WITH MAKEUP RESTRICTIONS. WHEN CUT-IN TO TRAIN UNDER THIS CONDITION, PART B BELOW WILL NOT APPLY.

24 TO 36

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.

THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS OF MULTI-PLATFORM CARS THAT ARE ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR)WEIGHING LESS THAN 60 TONS;
3. CAR WEIGHING LESS THAN 45 TONS.

IF REAR HELPER OR CUT-IN HELPER EXCEEDS EPA REQUIREMENTS IN ABOVE TABLES, SUFFICIENT LOCOMOTIVES MUST BE ISOLATED OR, ON AC LOCOMOTIVES ONLY, TRACTION MOTORS OR TRUCKS MAY BE CUT OUT TO MEET REQUIREMENTS TO PREVENT EXCEEDING EPA LIMITS IN TABLES.

B. TONNAGE PLACEMENT FOR CUT-IN HELPER.

WHEN THE FOLLOWING TONNAGE PLACEMENT REQUIREMENT CONFLICTS WITH TRAIN MAKEUP RESTRICTIONS IN THE "OTHER THAN A LOADED OR EMPTY BULK COMMODITY UNIT TRAIN" TABLE, A CUT-IN HELPER MAY BE MOVED UP TO FIVE CARS OR PLATFORM/WELLS AHEAD OR BEHIND THE CALCULATED POSITION TO COMPLY WITH THESE TRAIN MAKEUP RESTRICTIONS.

1. POSITION REQUIREMENTS FOR ONE CUT-IN HELPER.

TO DETERMINE THE PLACEMENT OF ONE HELPER: DIVIDE THE TOTAL TONNAGE OF THE TRAIN BY THE EPA OF BOTH THE HELPER AND THE LEAD CONSIST AND THEN MULTIPLY THAT NUMBER BY 1/2 THE EPA OF THE HELPER. THIS NUMBER IS THE TONNAGE TO BE PLACED BEHIND THE HELPER.

(TONNAGE OF TRAIN)

-----X(1/2 EPA OF HELPER)=(TONNAGE TO BE PLACED BEHIND HELPER)

(TOTAL EPA OF HELPER
AND LEAD CONSIST)

EXAMPLE: 115-0-16445 TONS
LEAD CONSIST: 2 C44AC - (24 EPA)
HELPER CONSIST: 2 C44AC - (24 EPA)

TOTAL: 48 EPA

16445 TONS

----- X (12) = 4111 (TONNAGE TO BE PLACED BEHIND HELPER)

48

2. POSITION REQUIREMENTS FOR CUT-IN HELPER WITH ADDITIONAL HELPER ON REAR.

TO DETERMINE THE PLACEMENT OF A CUT-IN HELPER WHEN THE TRAIN ALSO HAS A HELPER ON THE REAR, DIVIDE THE TONNAGE OF THE TRAIN BY THE COMBINED TOTAL OF THE EPA OF THE REAR HELPER, THE CUT-IN HELPER AND THE LEAD CONSIST. MULTIPLY THIS NUMBER BY THE COMBINED TOTAL OF THE EPA OF THE REAR HELPER AND 1/2 THE EPA OF THE CUT-IN HELPER. THIS NUMBER IS THE AMOUNT OF TONNAGE TO BE PLACED BEHIND THE CUT-IN HELPER.

(TONNAGE OF TRAIN)

-----X (EPA OF REAR HELPER + 1/2 EPA
PLACED BEHIND HELPER)

(TOTAL EPA OF ALL CONSISTS) OF CUT-IN HELPER)

EXAMPLE: 115-0-16445 TONS
LEAD CONSIST: 2 C44AC (24 EPA)
MIDDLE HELPER: 3 C44AC (36 EPA)
REAR HELPER: 1 C44AC (12 EPA)

TOTAL: 72 EPA

16445 TONS

----- X (12+18) = 6852 (TONNAGE TO BE PLACED

72 BEHIND CUT-IN HELPER)When determining the number of axles of power in a helper consist, refer to System Special Instructions Item 4 (Locomotive Table).

Not more than 36 axles of power may be used in a helper consist.

Unless otherwise specified, the placement of an entrained or rear helper will be governed by the following table.

Axles
Placement Requirements

Any Helper
Must be placed ahead of:

Single-platform single-axle front runner cars in series TTOX weighing less than 25 tons.
Solid drawbar connected four platform Four Runner cars in series TTFX.
Rail pick-up cars RGAX 4694-4696.
Two-axle scale test cars.
Cars designated rear end only.

First car ahead of any helper must not be:

A flat car which weighs less than 50 tons; or
An articulated doublestack or spine car having one or more empty platforms.

8 or less

May be placed behind caboose, or rear car of a cabooseless train or cut in ahead of 1/2 the tonnage rating of the helper locomotive(s). Within the state of California, not more than one unit operating or isolated may be placed behind a caboose.

9 to 12

May be:

Placed immediately ahead of caboose or on the rear of a cabooseless train provided the first 10 cars ahead of the helper meet one of the following conditions:

1. Each weighs 50 tons or more;
or
2. All are 73 feet or longer in length;
or
3. All are less than 73 feet in length.

Cut in ahead of 1/2 the tonnage rating of the helper locomotive(s).

13 to 18

On a "Loaded Bulk Commodity Unit Train," helper may be placed ahead of caboose or on rear of a cabooseless train.

On other than a "Bulk Commodity Unit Train," helper must be cut in ahead of 1/2 the tonnage rating of the helper locomotive(s);
and

The first car ahead of the helper must weigh 50 tons or more;

and

The first 10 cars ahead of the helper must meet one of the following conditions:

1. Each weighs 50 tons or more;
- or
2. All are 73 feet or longer in length;
- or
3. All are less than 73 feet in length.

19 to 24

Must be cut in ahead of 1/2 the tonnage rating of the helper locomotive(s). The first 10 cars ahead of the helper must all weigh 50 tons or more.

25 to 36

May only be used on a "Loaded Bulk Commodity Unit Train" and must be cut in ahead of 1/2 the tonnage rating of the helper locomotive(s).

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.8.2 Helper Placement

Change placement requirements table, "Any Helper" row to read:

Axles

Placement Requirements

Any Helper

Must be placed ahead of:

Single platform two-axle front runner cars in series TTOX weighing less than 25 tons.

Solid drawbar connected four platform Four Runner cars in series TTFX.

Rail pick-up cars RGAX 4694-4696.

Two-axle scale test cars.

Car designated rear end only

First car ahead of any helper must not be:

A flat car weighing less than 50 tons; or

An articulated doublestack car, spine car or solid drawbar-connected intermodal car having one or more empty platforms.

General Order No. 27 December 17, 2001

CHANGE RULE 31.8.2 IN ITS ENTIRETY TO READ:

RULE 31.8.2 HELPER PLACEMENT

THE TERM 'HELPER' AS USED IN THIS RULE REFERS TO EITHER A MANNED HELPER LOCOMOTIVE CONSIST OR A DISTRIBUTED POWER LOCOMOTIVE CONSIST NOT COUPLED TO THE LEAD/CONTROLLING CONSIST.

THE TERM 'EMPTY BULK COMMODITY UNIT TRAIN' AS USED IN THIS RULE APPLIES TO A TRAIN MADE UP ENTIRELY OF EMPTY CARS USED TO TRANSPORT COAL, GRAIN, ORE, POTASH, MOLTEN SULFUR, SODA ASH, PHOSPHATE ROCK, OIL, TACONITE OR OTHER BULK COMMODITIES.

THE TERM 'RESTRICTED TONNAGE LIMIT' REFERS TO THE TOTAL WEIGHT OF THE CARS IMMEDIATELY AHEAD OF THE HELPER. CERTAIN CARS ARE RESTRICTED FROM BEING WITHIN THAT TONNAGE LIMIT, TYPICALLY THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER.

A. REAR OR CUT-IN REQUIREMENT FOR HELPER
USE THE FOLLOWING APPLICABLE TABLE TO DETERMINE WHETHER A HELPER IS PLACED ON REAR OF TRAIN OR AT CUT-IN POSITION ON TRAIN.

LOADED BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

28 OR LESS

MAY BE PLACED ON REAR OR CUT-IN AS OUTLINED IN PART B BELOW. WHEN PLACED ON REAR, IT MUST BE PLACED AHEAD OF ANY CABOOSE.

29 TO 55

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.

EMPTY BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

16 OR LESS

MAY BE PLACED ON REAR OR CUT-IN AS OUTLINED IN PART B BELOW. WHEN PLACED ON REAR, IT MUST BE PLACED AHEAD OF ANY CABOOSE.

17 TO 32

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.

OTHER THAN A LOADED OR EMPTY BULK COMMODITY UNIT TRAIN

HELPER EPA (Equivalent Powered Axles)
PLACEMENT REQUIRED

Any Helper

MUST BE PLACED AHEAD OF:

1. RAIL PICK-UP CARS RGAX 4694-4696;
2. TWO-AXLE SCALE TEST CARS;
3. CARS DESIGNATED 'REAR END ONLY' OR 'REAR RIDER';
4. OCCUPIED CABOOSE.
5. SINGLE PLATFORM TWO-AXLE CAR IN SERIES TTOX;
6. SOLID DRAWBAR-CONNECTED FOUR PLATFORM CAR IN SERIES TTFX;

7 OR LESS

PLACED ON REAR.

8 TO 16

PLACED ON REAR. THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO CARS AND/OR THE PLATFORM/WELLS OF MULTI-PLATFORM CARS ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR) WEIGHING LESS THAN 60 TONS.

WHEN TRAIN MAKEUP WITHIN THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER DOES NOT MEET THE ABOVE REQUIRMENTS, HELPER MAY BE CUT-IN TO TRAIN TO A LOCATION THAT DOES PERMIT COMPLYING WITH MAKEUP RESTRICTIONS. WHEN CUT-IN TO TRAIN UNDER THIS CONDITION, PART B BELOW WILL NOT APPLY.

17 TO 23

PLACED ON REAR. THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO CARS AND/OR THE PLATFORM/WELLS OF MULTI-PLATFORM CARS ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR)WEIGHING LESS THAN 60 TONS.
3. CAR WEIGHING LESS THAN 45 TONS;

WHEN TRAIN MAKEUP WITHIN THE 250 TONS IMMEDIATELY AHEAD OF THE HELPER DOES NOT MEET THE ABOVE REQUIRMENTS, HELPER MAY BE CUT-IN TO TRAIN TO A LOCATION THAT DOES PERMIT COMPLYING WITH MAKEUP RESTRICTIONS. WHEN CUT-IN TO TRAIN UNDER THIS CONDITION, PART B BELOW WILL NOT APPLY.

24 TO 36

MUST BE CUT-IN AS OUTLINED IN PART B BELOW.

THE FOLLOWING MAKEUP RESTRICTIONS APPLY TO THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS OF MULTI-PLATFORM CARS THAT ARE ENTRAINED WITHIN THE 250 RESTRICTED TONNAGE LIMIT IMMEDIATELY AHEAD OF THE HELPER.

THE CONVENTIONAL CARS AND/OR PLATFORM/WELLS MUST NOT BE

1. MULTI-PLATFORM CAR HAVING EITHER AN EMPTY END PLATFORM/WELL OR TWO CONSECUTIVE EMPTY PLATFORM/WELLS;
2. CAR 45 FEET OR LESS IN LENGTH COUPLED TO A CAR 73 FEET OR LONGER IN LENGTH (EXCEPT FOR A MULTIPLATFORM SPINE CAR OR A MULTIPLATFORM DOUBLESTACK CAR)WEIGHING LESS THAN 60 TONS;
3. CAR WEIGHING LESS THAN 45 TONS.

IF REAR HELPER OR CUT-IN HELPER EXCEEDS EPA REQUIREMENTS IN ABOVE TABLES, SUFFICIENT LOCOMOTIVES MUST BE ISOLATED OR, ON AC LOCOMOTIVES ONLY, TRACTION MOTORS OR TRUCKS MAY BE CUT OUT TO MEET REQUIREMENTS TO PREVENT EXCEEDING EPA LIMITS IN TABLES.

B. TONNAGE PLACEMENT FOR CUT-IN HELPER.

WHEN THE FOLLOWING TONNAGE PLACEMENT REQUIREMENT CONFLICTS WITH TRAIN MAKEUP RESTRICTIONS IN THE "OTHER THAN A LOADED OR EMPTY BULK COMMODITY UNIT TRAIN" TABLE, A CUT-IN HELPER MAY BE MOVED UP TO FIVE CARS OR PLATFORM/WELLS AHEAD OR BEHIND THE CALCULATED POSITION TO COMPLY WITH THESE TRAIN MAKEUP RESTRICTIONS.

1. POSITION REQUIREMENTS FOR ONE CUT-IN HELPER.

TO DETERMINE THE PLACEMENT OF ONE HELPER: DIVIDE THE TOTAL TONNAGE OF THE TRAIN BY THE EPA OF BOTH THE HELPER AND THE LEAD CONSIST AND THEN MULTIPLY THAT NUMBER BY 1/2 THE EPA OF THE HELPER. THIS NUMBER IS THE TONNAGE TO BE PLACED BEHIND THE HELPER.

(TONNAGE OF TRAIN)
-----X(1/2 EPA OF HELPER)=(TONNAGE TO BE PLACED BEHIND HELPER)
(TOTAL EPA OF HELPER
AND LEAD CONSIST)

EXAMPLE: 115-0-16445 TONS
LEAD CONSIST: 2 C44AC - (24 EPA)
HELPER CONSIST: 2 C44AC - (24 EPA)

TOTAL: 48 EPA

16445 TONS
----- X (12) = 4111 (TONNAGE TO BE PLACED BEHIND HELPER)
48

2. POSITION REQUIREMENTS FOR CUT-IN HELPER WITH ADDITIONAL HELPER ON REAR.
TO DETERMINE THE PLACEMENT OF A CUT-IN HELPER WHEN THE TRAIN ALSO HAS A HELPER ON THE REAR, DIVIDE THE TONNAGE OF THE TRAIN BY THE COMBINED TOTAL OF THE EPA OF THE REAR HELPER, THE CUT-IN HELPER AND THE LEAD CONSIST. MULTIPLY THIS NUMBER BY THE COMBINED TOTAL OF THE EPA OF THE REAR HELPER AND 1/2 THE EPA OF THE CUT-IN HELPER. THIS NUMBER IS THE AMOUNT OF TONNAGE TO BE PLACED BEHIND THE CUT-IN HELPER.

(TONNAGE OF TRAIN)
-----X (EPA OF REAR HELPER + 1/2 EPA
PLACED BEHIND HELPER)

(TOTAL EPA OF ALL CONSISTS) OF CUT-IN HELPER)

EXAMPLE: 115-0-16445 TONS
LEAD CONSIST: 2 C44AC (24 EPA)
MIDDLE HELPER: 3 C44AC (36 EPA)
REAR HELPER: 1 C44AC (12 EPA)

TOTAL: 72 EPA

16445 TONS
----- X (12+18) = 6852 (TONNAGE TO BE PLACED
72 BEHIND CUT-IN HELPER)

31.8.3 Helper Cut Into or at Rear of Train
A. Before Angle Cocks Are Opened

When a locomotive is cut into or coupled at the rear of the train, before the angle cocks are opened, the helper engineer must:

1. Make a brake pipe reduction in an amount sufficient to reduce locomotive brake pipe pressure 1 - 2 pounds below the brake pipe pressure of the car being coupled into, as determined by the EOT pressure display. If there is no brake pipe pressure display at the car being coupled into, make a 20 pound brake pipe reduction.
2. Cut out the automatic brake valve and place the handle in the HANDLE OFF position.
3. Place the independent brake valve handle in the RELEASE position, and leave the independent brake valve cut in.
4. Couple the brake pipe hoses. Open the brake pipe angle cock on the locomotive first, then slowly open the brake pipe angle cock on the car.

B. Test when Helper Locomotive Is Attached or Detached

When the helper locomotive is cut into the train or at the rear of the train, the controlling locomotive must conduct an application and release test of the helper locomotive and the rear car as follows:

1. Reduce brake pipe pressure from the controlling locomotive to make sure at least a 5 pound brake pipe reduction occurs at the rear of the train, as shown on the helper locomotive gauge or EOT device. If total brake pipe reduction is less than 10 pounds, increase the reduction to at least 10 pounds.
2. After obtaining the desired reduction, release the train brakes by moving the automatic brake valve handle to the RELEASE position and make sure that at least a 5 pound brake pipe increase occurs at the rear of the train, as shown on the helper locomotive gauge or EOT device.
3. If a gauge or device is not available, visually determine the application and release of brakes on the rear car.

When the helper locomotive is detached from the train, the controlling locomotive must conduct an application and release test of the rear car as specified in Rule 30.4 (Application and Release Tests) before proceeding.

When the helper locomotive that was cut into the train is detached, the controlling locomotive must conduct an application and release test of the rear car as specified in Rule 30.4 before proceeding. When the helper locomotive that was at the rear of the train is detached, the controlling locomotive must verify brake pipe continuity as specified in Rule 31.3.2.

C. Controlling Locomotive Detached from Train

When the controlling locomotive will be detached from a train with a helper cut into or coupled at the rear, comply with Rule 30.5.1 (Detaching Locomotive or Separating Train), or transfer control of the brakes to the helper locomotive as follows:

1. The lead locomotive must make a 20 pound brake pipe reduction and then close both angle cocks between the locomotive and/or the cars being separated.
2. The helper locomotive must apply the independent brake fully and then:
 - a. Move the automatic brake valve handle to the RELEASE position to recover the equalizing reservoir pressure.

- b. Move the automatic brake valve handle into the service zone until the equalizing reservoir pressure is 5 pounds below the brake pipe pressure.
 - c. Place the brake valve cutoff valve in the FRT position.
3. If necessary, crew members must apply enough hand brakes on the low end to hold the train.
 4. The lead locomotive must adjust slack by slowly releasing the independent brake before detaching from the train.
 5. When the lead locomotive is re-attached to the train, control of the air brakes must be transferred to the lead locomotive as follows:
 - a. If not already at full service, the helper locomotive must increase brake pipe reduction to full service, cut out the automatic brake valve, and move the automatic brake valve handle to the HANDLE OFF position.
 - b. The lead locomotive must open angle cocks and recharge the train. Before proceeding, determine the indication of release at the rear of the train.

D. Overcharge Prevention

When the helper is cut out of the train and used to shove the rear portion back to the train, after attaching the rear portion, the helper must make a full service brake application before opening the angle cocks.

System Special Instructions Effective 0001 Sunday April 2 2000

SSI Item 10-C. 31.8.3 Helper Cut Into or a Rear of Train

Change last paragraph in B to read:

When the helper locomotive that was cut into the train is detached, the controlling locomotive must conduct an application and release test of the rear car as specified in Rule 30.4 before proceeding. When the helper locomotive that was at the rear of the train is detached, the controlling locomotive must verify brake pipe continuity as specified in Rule 31.3.2.

31.8.4 Helper at Head End of Train

A. Attached to Head End of Train

When a helper locomotive is coupled on the head end of the train, transfer control of air brakes to the helper locomotive as follows:

Before opening angle cocks between the road locomotive and helper locomotive the road engineer will:

1. Make not less than a 6 pound brake pipe reduction.
2. After brake pipe exhaust has ceased, cut out the automatic brake valve and place handle in the off position.
3. Notify the helper engineer of the amount of brake pipe pressure reduction made.
4. Independent brake valve must be left cut in.

Helper engineer will:

1. Move the automatic brake valve handle into the service zone to reduce the equalizing reservoir pressure at least 2 pounds below the brake pipe pressure reduction made by the road engineer.

2. After opening the angle cock, increase brake pipe reduction to at least 20 psi and observe a reduction at the rear of the train.
3. Release the automatic air brakes and observe that brake pipe pressure is being restored at the rear of the train.

At a Terminal. When a helper locomotive will be added to the head end of the train at a terminal, the road locomotive engineer must conduct the required terminal air brake test before the helper is attached. Attach the helper locomotive as specified in A above.

B. Detached from Head End of Train

When a helper locomotive will be detached from the head end of the train, the following must occur:

Helper engineer will:

1. Make not less than a 6 pound brake pipe reduction.
2. Notify the road engineer of the amount of brake pipe reduction made.
3. Detach helper locomotive.

Road engineer will:

1. Move the automatic brake valve into the service zone to reduce the equalizing reservoir pressure at least 2 pounds below the brake pipe pressure reduction made by the helper engineer before cutting in the automatic brake valve.
2. Increase brake pipe reduction to at least 20 psi and observe a reduction at the rear of the train.
3. Release the automatic air brakes and observe that brake pipe pressure is being restored at the rear of the train.

31.8.5 DISTRIBUTED POWER

Add New Rule 31.8.5 And Sub-Rules (.1 Through .6) To Read:

31.8.5 DISTRIBUTED POWER

General Order No. 27 December 17, 2001

Add New Rule 31.8.5 And Sub-Rules (.1 Through .6) To Read:

31.8.5 DISTRIBUTED POWER

31.8.5.1 Employee Familiarization

The following rules are specific to helper service by means of distributed power operations. In addition, employees who set up or operate distributed power equipment must be familiar with the requirements and instructions for the type of system they will operate. Due to the various versions of DP technology, these instructions are contained in the distributed power guide for system locomotives developed by the Railroad Company.

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31.8.5.2 Preparing Locomotives For Distributed Power Service

Locomotives that are radio linked on the service track for pre-testing must be unlinked prior to being placed in the train. Locomotives must be radio linked after they are placed in the train.

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Continuity Test Following Radio Link

Before making a brake pipe continuity test immediately following radio link, the air flow rate on each DP controlling locomotive in the train:

* Must Not Exceed 20 CFM.

Or

* becomes stabilized after charging. If the air flow rate does not reduce to 20 CFM and if there is no further decrease in flow rate for a period of at least 90 seconds then the flow rate is considered to be stabilized.

A. Brake Pipe Continuity And Leakage Test Required

A brake pipe continuity and leakage test will be required when a distributed power train:

* Is Originally Made Up.

* Increases its total length (including locomotive power) to greater than 7,500 feet. This will require unlinking from the remote(s) and re-linking in order to run these distributed power test functions.

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31.8.5.4 Radio Communication Interruption

When radio communication is interrupted, the last throttle command and brake pipe pressure being maintained by the distributed power remote(s) remain in effect for up to 90 minutes.

A. Idling remote during communication interruption to signal the affected remotes to return to idle and place them in the isolate mode, the engineer must make a 10 pound brake pipe reduction or increase the brake pipe reduction by 10 pounds (if brakes are already applied before the communication interruption occurred).

Warning: If the brake system is not fully charged at the time of a communication interruption, make a brake pipe reduction sufficient to reduce brake pipe pressure at least 5 pounds below the last brake pipe reduction.

B. Operation During Loss Of Communication

During a communications interruption between the lead and remote(s), keep the train moving, if possible, to a location where communications might improve.

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During a communications interruption between the lead and remote(s), keep the train moving, if possible, to a location where communications might improve.

31.8.5.5 Conditions Which Require Actions To Protect A Single Remote Locomotive

If remote locomotive is:

- * Dead and linked: set up unit in dead in train (dit) configuration until locomotive can be set out or moved to head-end of train.
- * Running and unlinked: set out locomotive or move to head-end of train.
- * Dead and unlinked: set out locomotive or move to head-end of train.

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31.8.5.6 Changing From Independent Mode To Synchronous Mode

When operating distributed power train consists in the independent mode, do not place locomotive consists in synchronous mode until all consists are in the same throttle setting, consistent with good train handling.

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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.

On moving trains equipped with a 2-way EOT device, a crew member must operate the Emergency switch without hesitation in any of the following situations:

If a crew member places the train into emergency in order to stop the train.

If train goes into emergency from any source while moving and EOT brake pipe pressure does not drop to zero.

or

Braking response or EOT brake pipe pressure does not indicate that service brake pipe reductions are being communicated through the train.

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 supervisor.

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 slacked stretched condition, do the following:

1. Recognize that some units are equipped so that if an emergency application of brakes is received from any source other than the engineer's brake valve or the emergency brake valve in the cab of the leading unit, a 20-second delay is available before the power cuts off.
2. Move the throttle to the IDLE position as soon as practical if power was being used when the emergency application occurred.

B. Slack Bunched Condition

If the train is in a slack bunched condition, do the following:

1. Recognize that all Union Pacific locomotives equipped with dynamic brakes provide continuous dynamic braking any time an emergency application of the brakes occurs from any source. Move the dynamic brake operating lever to the OFF position after the train stops.
2. When the dynamic brake is not in use, regulate the locomotive brakes to keep the slack bunched, being careful not to slide the locomotive wheels.

C. Stopped on a Grade

When a train is stopped on a grade by an emergency application and the locomotive brakes might not hold the train while it is recharging, apply enough hand brakes on the low end to hold the train.

D. Defective Control Valve

If the emergency brake application was most likely caused by a defective control valve and a defective valve is not found, control the train by using dynamic brakes 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.

A. Brake Application

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

1. Apply hand brakes to the extent needed on the low end of 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.

B. On a Descending Grade

If the train separates on a descending grade, after the train is recoupled, bunch the slack as much as possible before recharging the air brake system.

C. On an Ascending Grade

If the train separates on an ascending grade, after the train is recoupled, stretch the slack as much as possible before recharging the air brake system.

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.

Whenever a brake pipe pressure reduction of 5 pounds or more is observed from the EOT device due to an unknown cause and brakes do not apply, the engineer must ascertain brake pipe continuity by making a brake pipe reduction and observing a reduction in pressure on the head end display. If the head end display does not indicate a brake pipe reduction, stop the train and inspect to determine that the train is intact and that the brakes apply on the rear car.

31.9.5 Thermal Misalignment

When an obvious thermal misalignment is observed by a crew ahead of their moving train, the train must be stopped, if possible, prior to the lead locomotive passing over the misaligned track. If the train cannot be stopped in time with service applications, to minimize additional buff forces imparted on the track, the preferred method for train handling is as follows:

- When the train is equipped with a 2-way EOT, stop the train using the emergency toggle switch on the HED to place the train into emergency from the rear end. Control slack as described in rule 31.9.2.
- When the train is equipped with distributed power at the rear of the train, stop the train using a full service brake application. Control slack as described in rule 31.9.2.

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Add New Rule 31.9.5 To Read:

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31.10 Penalty Brake Applications

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 overspeed setting.
2. A more restrictive cab signal indication is not acknowledged within 6 seconds of its reception (acknowledge the signal by moving the acknowledging handle from NOR to ACK to NOR).
or
3. 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 or the dynamic brake operating lever OFF.
2. If the stop is caused by the cab signal, make sure the signal change is acknowledged with the acknowledging device.
3. When the PCS resets, move the automatic brake valve handle to RELEASE.

31.11 Running Backwards

During back-up 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 runout or possible break-in-two.
2. Gradually reduce the throttle as train speed decreases.

When a train must move backward with a locomotive at the rear of the train, transfer control of the brakes to the rear locomotive before starting movement.

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 brakes throughout the train.
 - a. On articulated cars, control valves are located on platforms with air reservoirs, and auxiliary air reduction valves are located on platforms without air reservoirs. If more than one control valve and one auxiliary air reduction valve in a series must be cut out, set out the articulated car.
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 dispatcher 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 these 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 train dispatcher and, when possible, the repair forces at the next repair point or terminal.
4. If a passenger car has defective brake equipment, do the following:

- a. Close the brake cylinder cutout cocks connected to the defective brake.
- b. If the car with the defective brake is the rear car of the train, ensure that the hand brake is operative and a trainman is in position to operate the hand brake if necessary. Place the car between two cars with operating brakes at the first available 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 train dispatcher.

31.13.4 Units Isolated, Shutdown, or Failed Enroute

A. Contact Train Dispatcher

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

B. 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 train dispatcher. When the affected unit is part of a Distributed Power remote consist, advise the train dispatcher of this fact.
2. The train dispatcher 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. If assistance is needed to locate drain valves, contact the train dispatcher or Locomotive Help Desk. Exception: Before checking, restarting, or manually draining a unit in a distributed Power remote consist, check with the train dispatcher. Special arrangements may be made to have other personnel perform this work.

C. Do Not Isolate Controlling Unit

The controlling unit of a locomotive consist (including both lead and helper locomotive consists) must be on line while the train or engine is moving, unless the unit is not operating properly.

D. Tagging Requirements

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

32.0 MISCELLANEOUS AIR BRAKE RULES

32.1 Blocking Independent Brake

32.2 Air Gauges

32.3 Slack in Train

32.4 Sanders

32.5 Overcharged Air Brake System

32.6 Do Not Adjust Air Brake Controls

32.7 Main Reservoir Pressure when Charging

32.8 Locomotive Reversed

32.9 Speed and Amperage of Locomotive Consist

32.10 Wheel Slip Warning Lights

32.11 Switching with Units Having Non-Alignment Control Couplers

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 Sanders

Units are equipped with automatic sanding to control wheel slip. If manual sanding is necessary, use the "Lead Axle Sand" switch before using the "Sanding" lever or button. Do not use excessive sand.

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 switching locomotive 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. On GE DASH 8 locomotives, leave the throttle in IDLE. On other locomotives, 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 reverser opposite to the direction of travel when a locomotive is moving, unless at a loading or unloading facility where the "plug" method of speed control is required.

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, as listed in the timetable.

Locomotives not equipped with a plaque stating "This unit does not have a short time rating" must maintain a minimum continuous speed of 11 MPH or more when operated at full throttle.

Locomotive units equipped with computer micro-processors 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 ratings 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.

The following requirements also apply:

1. Since short-time ratings are not cumulative, do not operate a unit for 15 minutes at the 1/4-hour rating, then for 30 minutes at the 1/2-hour rating, etc.
2. If the train cannot proceed within the specified limits, stop the train and report the condition to the train dispatcher. The train dispatcher will then indicate whether to reduce the tonnage or provide additional power.

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 or dynamic braking force. If the warning continues after power or dynamic braking is reduced, stop the train and verify that all locomotive wheels are rotating freely.

32.11 Switching with Units Having Non-Alignment Control Couplers

The UP S9-S31 units do not have alignment control couplers. When one or more of these units is in a locomotive consist and making a shoving or backup movement that involves 15 or more cars per operative unit, do the following:

Use no more than 16 powered axles to avoid possibly jack-knifing between these units or between the rear unit and the first car of the train.

Begin isolating units farthest from the cars to be shoved, excluding the controlling unit, isolating consecutive units until not more than 16 powered axles are on line.

EXCEPTION: If the consist includes only one non-alignment unit and this unit is the farthest from the cars being shoved, do not isolate any units.

