SD40-2

OPERATOR'S MANUAL

OPERATING MANUAL

SD40-2 DIESEL–ELECTRIC LOCOMOTIVES

FOR BN ROAD NUMBERS:
6773 – 8029

Based on an actual SD40-2 operating and service manuals.

These instructions do not purport to cover all details or variations in equipment represented in-game nor to provide for every possible contingency to be met in connection with operation. Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purposes, the matter should be referred to Searchlight Simulations.

THIS OPERATING MANUAL IS INTENDED FOR THE USE IN TRAIN SIMULATOR ONLY. SPECIFIC PORTIONS OF THE ORIGINAL MANUAL HAVE BEEN INTENTIONALLY LEFT OUT. DO NOT ATTEMPT TO USE FOR REAL-LIFE TRAINING.

Revisions are indicated by margin bars.

FOREWORD

This Operating Manual is arranged in sections: INTRODUCTION, OPERATING CONTROLS, OTHER EQUIPMENT, ALARMS AND SAFEGUARDS, OPERATION.

The INTRODUCTION Section describes the first steps when entering a new scenario and gives a general overview of the Locomotive, including general locomotive data and required keybindings.

The OPERATING CONTROLS Section continues this overview by identifying the associated hardware located in the operating cab.

The OTHER EQUIPMENT Section explain the basic steps on setting up the radio equipment and Head Of Train Device on-board.

The ALARMS Section lists, describes, and illustrates the various Alarms, Safeguards an operator may encounter.

The OPERATING PROCEDURES Section gives step–by–step instructions for locomotive operation as well as listing various functions available for use. The OPERATING PROCEDURES Section will guide the Operating Crew in operation of this locomotive.

While it may not be entirely necessary to know all of the locomotive's functions running in the background, reading about them in the manual might save you the hard climb if you know what signs to look out for. We STRONGLY advice to carefully read through this Operating Manual before attempting to use this product.

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PRODUCT ACTIVATION / INSTALLATION

IMPORTANT INFORMATION

THIS PRODUCT REQUIRES AN ACTIVE INTERNET CONNECTION DURING FIRST RUN-TIME TO PERFORM A PRODUCT LICENSE CHECK. CONTINUOUS INTERNET ACCESS IS NOT REQUIRED.

64 bit

THIS PRODUCT WILL ONLY RUN ON TRAIN SIMULATOR 64-BIT EDITION. TRAIN SIMULATOR 32-BIT EDITION IS NOT SUPPORTED.

PRODUCT ACTIVATION

***NOTE**: YOU WILL UPON PURCHASE RECEIVE A SEPARATE EMAIL LABELLED "SEARCHLIGHT SIMULATIONS PRODUCT ACTIVATION" . ALL FURTHER STEPS ON HOW TO ACTIVATE THE PRODUCT ARE EXPLAINED WITHIN THAT EMAIL. CHECK ALL YOUR INBOX/SPAM FOLDERS IF YOU CAN'T SEEM TO FIND THE ACTIVATION EMAIL ON FIRST SIGHT. MAKE A BACKUP OF THE PRODUCT ACTIVATION EMAIL AND KEEP IT SOMEWHERE SAFE, DO NOT DELETE IT OR YOU WON'T BE ABLE TO RE-ACTIVATE YOUR PRODUCT. YOUR PRODUCT LICENSE IS VALID FOR TWO UNIQUE ACTIVATIONS. A THIRD ATTEMPT WILL DISABLE YOUR PRODUCT KEY.*

PRODUCT INSTALLATION

This product is delivered in a packaged, ready-to-install archive (.ZIP file extension). In order to access the executable auto installer inside the archive, you will require a free or commercial copy of either WinRAR or 7ZIP, available from the links below.

– *www.7-zip.org*

– *www.win-rar.com*

Inside the archive you'll find a executable auto installer for the product. Double click the installer to run it and follow the steps to install your product.

***NOTE**: Make sure to adjust the default installation path on the installer to match your default Railworks install location if needed, otherwise the product won't show up in-game. Should you be unsure of your default Railworks install location, run a windows search for "Railworks" on your system. This will point you to the correct install location.*

LIMITATIONS OF CORE SOFTWARE

IN-GAME PERFORMANCE

We have worked hard on the performance aspect of this locomotive to improve loading and frame update times of the scripts wherever possible whilst also maintaining healthy loading times even with the extremely detailed model and exceptionally high resolution textures. Unfortunately we are limited to Train Simulator's long-term single-thread problem. This means that everything happening behind the scenes in terms of engine calculations for audio, physics, visuals etc. is solely run by a single CPU core. Overall performance will vary depending on the single thread performance of your CPU. It won't matter whether your CPU has 4,8 or even 16 cores since only one of them will actively be used by the game. Multi-thread support can not be posthumously added into the game as it would require a complicated rewrite of the entire core game structure.

Due to this, overall locomotive performance on performance-heavy routes or scenarios will vary. A single 3x0x0 consist for instance with minimal AI traffic will even on highest game settings perform very well in terms of FPS, however with heavy AI traffic, this might rapidly change. Our included scenarios for instance will chunk a lot of performance due to high AI traffic and multiple consist being on a single tile at times. It is important to note that Train Simulator will execute all engine scripts, even on AI controlled trains, if said train is on the same tile as the player controlled train. So if an AI train disappears out of view but still has to clear the same tile the player controlled train is currently on, performance will not increase.

LOADING TIMES

Loading times can be problematic and annoying, especially with a higher-than-average demanding locomotives like our SD40-2s. You will notice longer loading times than usual when you first load in an SD40-2 in custom routes or scenarios. Loading times can be significantly reduced if you run Train Simulator off of an external SSD.

ANIMATION SPEED

Animations are unfortunately bound to in-game performance (fps). If you experience slow animations (wipers for instance) or certain key-frames being skipped (external bell for instance), it's due to your in-game performance being low.

INTERNAL BEACON/STROBE LIGHT CLIPPING

To increase in-game performance, we've disabled shadow casting on the beacon/strobe light equipped SD40-2s. This in turn however results in the lights clipping through the cab roof and illuminating certain parts inside the operating cab when turned on. For the most part you won't notice the light clipping but it's worth noting.

AUDIO CUTTING OUT

Much like anything else, the locomotive audio heavily depends on good in-game performance (fps) to deliver the ultimate experience. You may encounter audio cutting out at times. This can occur when your in-game performance (fps) is low.

GETTING STARTED

ENGINE INITIALIZATION

Upon scenario start you will notice a small alert message window come up in the top right hand corner of the screen. The message window display "INITIALIZATION IN PROGRESS..." and will stay visible for about five seconds. During the initialization time, the core locomotive systems are automatically set-up and the locomotive functions are inaccessible by the player.

> ***NOTE**: The player may select the locomotive at any given time during scenario run-time. The initialization process will run only once the locomotive has been actively selected by the player in-game, provided a "driver" has previously been attached to it.*
>
> ***NOTE: During initialization, all available control surfaces within the operator cab will automatically be reset to their respective position. DO NOT ATTEMPT TO MOVE ANY CONTROL SURFACES DURING INITIALIZATION.***
>
> ***NOTE**: **In-game engine Initialization may fail for the following reasons.***
>
> - *Missing serial*
> - *Serial verification failed*
> - *Serial activation failed*
> - *Key verification failed*
> - *TS running in 32-Bit*

Every failed initialization (except for when the game is run in 32-bit) will trigger a "Scenario Failed" message, further explaining the reason behind the failed initialization. Take the necessary steps mentioned within the message to solve your problem.

MISSING HUD ELEMENTS

Given the nature of our sophisticated engine simulation, certain HUD elements for simple engine controls have been removed as they no longer serve a purpose on our locomotive. This is by intention and no bug with the product.

LOCOMOTIVE IN-GAME NOISE LEVELS

We've scripted our audio in a way to automatically lower overall external engine noise level based on the total locomotive count in your consist. That way we can maintain healthy and balanced audio levels for accessory like horn/bell, radiator/dynamic brake fans etc.. Internal noise levels will remain the same, no matter the locomotive count in your consist.

ENGINE WARMING (ISOLATION SWITCH)

Burlington Northern locomotives were equipped with winter isolation. Placing the Isolation switch in the lowest position (white arrow pointing downwards) will place the engine into winter isolation mode.

> ***NOTE**: In winter isolation mode, engine speed will be increased to NOTCH 3 speed. Engine speed will return back to Idle if the Isolation switch is moved out of the winter isolation position.*

GETTING STARTED

AI CONTROLLED LOCOMOTIVES

None player controlled locomotives feature our in-house AIX simulation. In short this means that AI locomotives will dynamically throttle up and down, produce accurate sounds and light effects based on their acceleration. This was done to add more life to AI traffic and to ensure that AI controlled locomotives respond more natural to movement and speed. You will notice how headlights come on and off on AI controlled engines as they accelerate or come to a stop along with dynamic throttle changes which add to a better and overall more realistic running experience.

***NOTE**: Headlight light casting on AI locomotives will come on/off automatically based on the season and time.*

Winter: 0600 - 1800 = OFF
Spring: 0530 - 1830 = OFF
Summer: 0515 - 2030 = OFF
Autumn: 0530 - 1900 = OFF

MU (MULTIPLE UNIT) REQUIREMENTS

Locomotives placed at the mid or rear of your train will respond to input from the lead locomotive provided the Isolation switch in the respective unit is set in “RUN”, the Engine Run and Control/Fuel Pump switches are in the “UP” position. This will however require rolling stock that's set up to forward consist messages. Since most default rolling stock does not come equipped with consist messaging, we highly suggest you only use rolling stock provided by either Searchlight Simulations or Jointed Rail.

***NOTE**: Rolling stock equipped with consist messaging can be downloaded for free on our store.*

3rd PARTY DLC COMPATIBILITY

Unfortunately due to limitations we can not offer compatibility to 3rd party locomotive DLCs. Our locomotives are only compatible among each other, locomotives released in cooperation with Jointed Rail, our enhancement packs and default locomotives.

SIMPLE CONTROLS AND EXTERNAL 3rd PARTY CONTROLLERS

This locomotive will not properly work with simple controls, or other external controllers such as Xbox or Playstation. Nevertheless, external controllers can be used in conjunction with this locomotive, however note that optimal results are achieved with expert controls and mouse/keyboard input only.

EQUIPMENT DEFECT DETECTOR COMPATIBILITY

The locomotives provided with this pack come equipped with our in-house Equipment Defect Detector capability.

***NOTE**: Our Equipment Defect Detectors can be downloaded for free on our store.*

GETTING STARTED

UNMANNED LOCOMOTIVES

None player driven/none player selected/controlled consists or single locomotives will automatically switch into the Ready-To-Run state.

In the Ready-To-Run state, the locomotive Isolation switch will automatically be set to “RUN”, the Engine Run, Control/Fuel Pump and the Generator Field switch will automatically be set in the “UP” position and the locomotive(s).

This also applies to rear pusher or trailing locomotives even if they have been previously player driven or at least part of an active player driven consist.

Every time a rear pusher or trailing locomotive is disconnected from the player driven consist, the disconnected locomotive(s) will switch back into the Ready-To-Run state. A slight delay might occur before this happens.

A locomotive already set in the Ready-To-Run state can still be operated as usual when selected by the player. Prior to moving a locomotive in the Ready-To-Run state.

> ***NOTE**: The Ready-To-Run state will not directly occur on a scenario start or scenario restart. An active timer of 5 seconds is in-place to allow the player to select his/her consist BEFORE any locomotives in said consist switch into the Ready-To-Run state.*

This is in place for players who wish to set-up all of their active locomotives in their consist manually for the run ahead. If you don't feel like setting every locomotive up manually and just want to get going, wait until your consist switches in the Ready-To-Run state BEFORE selecting your consist.

GETTING STARTED

TRAIN SIMULATOR GRAPHICS SETTINGS

DYNAMIC LIGHTING

This product does not specifically require dynamic lighting to be enabled, however for the visual, aesthetic value of the product we highly suggest you running it only with dynamic lighting enabled.

HEADLIGHT FLARES

This product requires headlight flares to be enabled in your main Train Simulator settings tab.

> ***NOTE: Without headlight flares enabled in your Train Simulator settings tab, the headlights flares will not be visible and the headlights will not cast any light on the ground.***

LIGHT CONTROL

TRAILING UNITS AND DPUS

Lights on player controlled trailing units have to be manually changed.

DAY VS NIGHT LIGHTING

Our SD40-2s come equipped with the ability to cycle between day and night gage lights provided the gage lights are turned on. See **Keybindings** Section of this manual.

HEADLIGHT LIGHT CASTING

You can control the headlight light casting through a keybind. This is in place to avoid the headlights spilling light during daylight. Thanks to this feature you can disable the light casting during daylight but toggle it back on in tunnels for instance. See **Keybindings** Section of this manual.

SHADOW CASTING LIGHTS

Certain external light sources can be toggled on or off to cast shadows. Shadow casting is extremely performance impacting and we do NOT suggest running with shadow casting enabled at all times. The ability to toggle shadow casting lights has been added so the user can take realistic night screenshots in-game. See **Keybindings** Section of this manual.

GENERAL LOCOMOTIVE DATA

Controls . . . . . AAR
Wheel Arrangement . . . . . C–C
Engine Data:
Horsepower – Traction 3000
Number of Cylinders 16
Model . . . . . EMD 645
RPM 904
Compression Ratio 14.5:1
Cycle 2
Turbocharged . . . . . Yes
Type E3
Traction Equipment:
Traction Motors (6) D78
Major Dimensions (Approximate):
Length . . . . . 68 ft. -10 in.
Height . . . . . 15 ft. -07.125 in.
Width . . . . . 10 ft. -03.125 in.
Driving Wheel Diameter (in.) 40
Weight (lbs, maximum) 396,000
Maximum Continuous Tractive Effort (lbf) / Speed (mph) 82,100/11
Maximum Starting Tractive Effort (lbf) 115,000
Peak Braking Effort (lbf/mph) 60,000/24.5
Gear Ratio 62/15
Maximum Speed (mph) – worn wheels 70
Supplies:
Fuel Tank (usable gallons) 3200
Coolant (gallons) 260
Lubricating Oil (gallons) 343
Sand (cu. ft.) 65
Compressor, Air:
Compressor Drive . . . . . Shaft Driven
Maximum Displacement (cfm) 200

KEYBINDINGS

Combined Throttle
- Increase . . . . . **A**
- Decrease . . . . . **D**

Reverser
- Increase . . . . . **W**
- Decrease . . . . . **S**

Automatic Brake
- Increase . . . . . **'**
- Decrease . . . . . **;**

Independent Brake
- Increase . . . . . **]**
- Decrease + Actuate . . . . . **[**

Horn . . . . . **Space**
Bell (Toggle) . . . . . **B**

Front Headlight
- Increase . . . . . **H**
- Decrease . . . . . **Shift + H**

Rear Headlight
- Increase . . . . . **Ctrl + H**
- Decrease . . . . . **Ctrl + Shift + H**

Engine Control
- Increase . . . . . **I**
- Decrease . . . . . **Shift + I**

Alerter Reset . . . . . **Q**
Alerter Override (Toggle) . . . . . **Backspace**
Engine Prime . . . . . **Shift + P**
Engine Start . . . . . **Shift + K**
Engine Shut . . . . . **Shift + L**
Head + Rearlight Light Casting (Toggle) . . . . . **Ctrl + Shift + L**
Gage Lights Day/Night (Toggle) . . . . . **Ctrl + L**
Shadow Casting (Toggle) . . . . . **Return**

Isolation Switch
- Increase . . . . . **I**
- Decrease . . . . . **Shift + I**

OPERATING CONTROLS

FIG. 1.

REF	DESCRIPTION
1.	THROTTLE HANDLE
2.	DYNAMIC BRAKE HANDLE
3.	REVERSER HANDLE
4.	AUTOMATIC BRAKE HANDLE
5.	INDEPENDENT BRAKE HANDLE
6.	HORN VALVE
7.	BELL VALVE
8.	SAND PUSHBUTTON
9.	LEAD AXLE SAND PUSHBUTTON
10.	ALERTER RESET BUTTON
11.	RADIO EQUIPMENT
12.	GAGE/GND AND STEP LIGHT SWITCHES
13.	ENGINE RUN, GEN FIELD AND ENGINE CONTROL/FUEL PUMP SWITCHES
14.	FRONT HEADLIGHT SWITCH
15.	REAR HEADLIGHT SWITCH
16.	ATTENDANT CALL PUSHBUTTON
17.	AUX SIDEWALL HEATER SWITCH
18.	HOTD (HEAD OF TRAIN DEVICE)
19.	ALERTER

FIG. 2.

REF	DESCRIPTION
1.	ENGINE STOP PUSHBUTTON
2.	ENGINE ISOLATION SWITCH
3.	DYNAMIC BRAKE CUTOUT SWITCH
4.	FRONT NUMBERBOARD LIGHT SWITCH
5.	REAR NUMBERBOARD LIGHT SWITCH
6.	FRONT CLASSLIGHT SWITCH
7.	REAR CLASSLIGHT SWITCH
8.	ENGINE COMPARTMENT LIGHT SWITCH
9.	PLATFORM LIGHTS SWITCH

CLEAN CAB RADIO

CLEAN CAB RADIO

Overview

To select a radio channel, press the TONE button. This will prompt you to enter a tone number. Select one of the DTMF numbers [0-9] to enter a tone number. Next up, press the CHAN button on the radio. This will blank out the transmitting (TX) and receiving (RX) channels and will prompt you to enter the first digit of the transmitting channel. Press the channel number to enter it and it will prompt you to enter the second channel number for the transmitting channel.

Repeat the same process for the receiving channel. To overwrite the active TX and RX channels, press the CHAN button again.

> ***NOTE**: The TX and RX channels can only be overwritten when both channels have previously been assigned a channel number. Overwriting just the TX or RX channel is invalid.*

Operation Guideline

SCENIC SUBDIVISION

CHANNEL NUMBERS:

MP 18 - Lowell: AAR 76-76
Lowell - Wenatchee: AAR 66-66

MILK RIVER SUBDIVISION, HI-LINE SUBDIVISION, KOOTENAI RIVER SUBDIVISION

CHANNEL NUMBERS:

Main Channel: AAR 70-70

HEAD OF TRAIN DEVICE

HEAD OF TRAIN DEVICE (HOTD)

Device Unarmed

By default, the HOTD (Head Of Train Device) will be unarmed. If an EOTD (End Of Train Device) is coupled up to your train, you may press the Communications Test/Arm push button to arm the HOTD.

> ***NOTE**: An HOTD can only be armed when the locomotive speed is zero MPH (Miles Per Hour).*

If properly armed, the HOTD will show a pressure reading from the rear of your train. Notice the Emergency Capability status light come on (EMERG ENABLED). If the locomotive speed is 1MPH or greater, you may initiate an Emergency Brake Application by flipping the Emergency Switch on the HOTD.

> ***NOTE**:Uncoupling cars with the locomotive speed 1MPH or greater will result in a automatic Emergency Brake Application and will require a full PCS reset. Refer to the ALARMS AND SAFEGUARDS section of this manual.*

> ***NOTE**: Your consist must be entirely made up of JointedRail/Searchlight Simulations rolling stock in order for the HOTD to show a rear pressure reading. Regular rolling stock does not have the ability to pass on consist messaging which is essential for this feature to operate and work as intended. The JointedRail/Searchlight Simulations EOTD (End Of Train Device) can be downloaded for free on our store.*

Device Armed

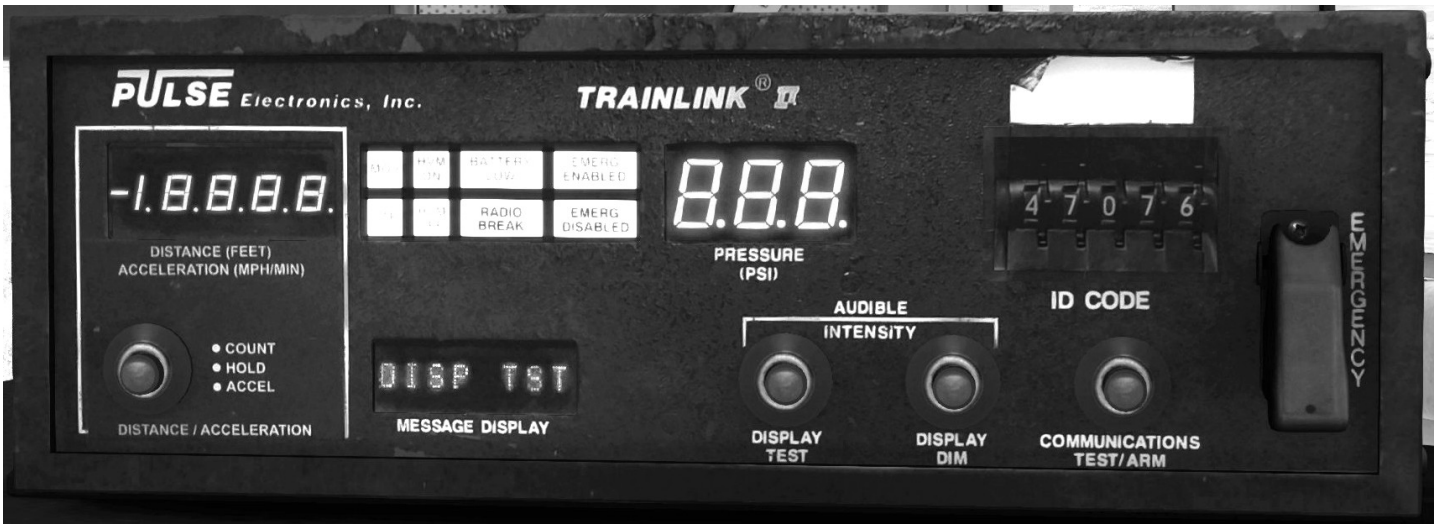
> ***NOTE**: The HVM (High Visibility Marker) will come ON/OFF depending on the time of day. During daylight operation, the HVM will remain off on the EOTD (If connected) and the HVM OFF indicator will show on the HOTD.*

The STP (STOP) and MOV (MOVE) status lights indicate whether the EOTD is moving or not. The status light will not change from STP to MOV until the EOTD senses a movement. Depending on the length of your train, it may take a few seconds before the light changes on the HOTD display.

The displayed Brake Pipe Pressure readout on the pressure display is the actual pressure at the rear of the train. The propagation of the air pressure wave is simulated through our advanced brakes so that the pressure readout changes a short time after the actual pressure readings on the air gauges on the control stand.

By default the HOTD will display the current acceleration (MPH per minute) of the train. Pressing the Distance/Acceleration button on the HOTD will bring up the distance counter. The counter will count up from 0 and display the measured distance in Feet.

With the counter actively counting, pressing the Distance/Acceleration button once again will stop the counter and the measured distance will remain displayed on the HOTD until the Distance/Acceleration button is pressed once again. This will erase the previously measured distance and bring the accelerometer back up.



Display Test

Pressing the Display Test button on the HOTD will test the display for the duration the button is pressed. A display test can be performed at any given time.

ALARMS AND SAFEGUARDS

ALERTER

The Alerter promotes safe train operation by monitoring various operator movements to ensure the alertness of the operating crew. If a proper control movement is not detected within a predetermined reset time period, an alarm sequence including audible and visual alarms is started requesting an acknowledgement. Lack of response to the system during this time will result in a penalty brake application by de–energizing the Alerter Magnet Valve. This action will command a full service brake application bringing the locomotive to a stop.

The Alerter starts counting down from sixty seconds. After sixty seconds and with no acknowledgement it will begin to flash. With no response, an audible alarm will sound eight seconds later. The operator is then given another ten seconds to respond before a penalty brake application is automatically initiated.

***NOTE**: The Alerter Function is disabled when Brake Cylinder pressure is greater than 25 psi or the Alerter Override is enabled.*

The following control movements will reset the Alerter:

- Operating the Alerter reset pushbutton
- Operating the Bell switch, Horn valve, or movement of the Reverse handle or Throttle handle
- Movement of the Automatic Brake handle, Independent Brake handle, or Bail–off
- Change in Dynamic Brake

EMERGENCY SANDING

Emergency sanding is automatically applied in FORWARD and REVERSE directions during all Emergency Brake applications for a sufficient time to stop the train.

PCS FUNCTION OPERATION

An emergency brake application will cut power, reduce the engine speed to Idle and illuminate the PCS OPEN indicator light on the control stand.

To reset the PCS Function:

1. Move the Throttle to IDLE.

   ***NOTE**: If the PCS Function has been activated while in dynamic braking, the Braking handle must be returned to OFF to reset the circuit. Dynamic braking will be retained when PCS is open.*

2. For **Penalties**, proceed to **Step a**. For **Emergencies**, proceed to **Step b**.

   a. Move the Automatic Brake Handle to SUPPRESSION and wait at least eight seconds for Power Up, Over-speed, or other Penalty applications.

   b. Move the Automatic Brake Handle to EMERGENCY and wait at least 60 seconds for Trainline, Operator, EOT, or Brake Valve Emergencies.

3. Move the Automatic Brake Handle, when instructed and ready, to RELEASE.

***NOTE**: Penalty applications can be reset "on the fly" meaning the locomotive does not need to come to a full stop before the penalty can be reset.*

WHEELSLIP

The WS10 wheel slip control system continuously monitors axle amperage averages against the the No. 2 Axle generator speed. If a slip is detected under power, total alternator output and output to the affected axle pairs is reduced until all motors have returned to an acceptable average variation. If slide is detected under dynamic braking, total braking resistance is reduced until sliding stops. Under both circumstances, automated sand application may occur. If the operator anticipates a scenario where slip is very likely to occur, they may choose to apply sand manually via either the lead axle sand switch, or the momentary sanding button found on the control stand.

Instantaneous reduction of locomotive power together with automatic sanding functions to correct wheel slip. After adhesion is regained, a timed application of sand continues while power is smoothly restored. The system functions entirely automatically, and no action is required by the locomotive operator. Depending upon the seriousness of the slipping condition, the wheel slip light may or may not flash on and off as the wheel slip control system functions to correct the slips. However, the wheel slip control system reacts so rapidly to correct minor slips that the wheel slip light seldom comes on to indicate severe slips. The wheel corrective action is often seen at the load current indicating meter as a steady reduction of load current below that which is normally expected at full throttle for a given speed. Do not misinterpret this power reduction as a fault. It is simply the wheel slip control system doing its job and maintaining power at a level within the adhesion conditions established by track and grade.

***NOTE**: Whenever possible, operation on grades should be at full throttle position. Throttle reduction during wheel slip is recommended only when:*

1. *Repeated wheel slip conditions cause severe lurching that may pull a train apart. (Such severe conditions may indicate the need for a helper or the need to take the train up the hill in two parts.)*

2. *In unusual conditions, simultaneous wheel slips may be incurred at low or stall speed. In this situation performance of the equipment is directly related to the skill and judgment of the operator. Therefore, the operator must determine to apply sand to the rail and/or reduce throttle.*

STARTING ENGINE

A engine shutdown will require a manual restart of the engine. The following conditions must exist.

1. *Reverser in CNTR position.*
2. *Engine Run and Engine Control/Fuel Pump switch are in the ON positon.*
3. *Generator Field switch in the OFF position.*
4. *Isolation Switch in START/STOP/ISO position.*
5. *Independent Brake fully applied.*

With the above conditions met, press and hold Shift + P for at least 5 seconds. Next release both Keys to stop priming the engine.

Shift + K will then engage the starter. Release Shift + K once you hear the starter turn the engine.

FASTER AIR PUMPING

To provide faster air pumping on locomotive, when reservoirs have been drained or after the locomotive has been coupled to a train, proceed as follows:

1. *Leave the Generator Field switch in the OFF position.*
2. *Place Reverser in CNTR position.*
3. *Advance Throttle above IDLE.*

BEFORE MOVING LOCOMOTIVE

1. *Place Rear and Forward Headlight switch in the proper position for required operation.*
2. *Set Isolation switch into the RUN position.*
3. *Make an Independent air brake application.*
4. *Release the hand brake and remove any blocking from the wheels. The train is now ready for operation. Refer to the OPERATION section of this manual.*

MOVING A TRAIN

1. *Set the Generator Field switch to ON.*
2. *Move the Reverser Handle to the desired direction of movement.*
3. *Release the brakes completely.*
4. *Advance the Throttle. The Throttle has notches, with each successive notch representing an increase in power, or locomotive tractive effort.*

STOPPING A TRAIN

Move the Throttle to IDLE, and apply the dynamic or air brakes according to Railroad Regulations. Also refer to Applying Dynamic Brakes paragraph located later in this section. If leaving the engineer's position after the train has stopped, center the Reverser.

STOPPING ENGINE

1. *Move the Throttle to IDLE.*
2. *Set the Generator Field switch to OFF.*
3. *Set the Isolation switch to START/STOP/ISO position.*
4. *Press the Engine Stop pushbutton on the Engine Control Panel and hold it in for at least five seconds or press Shift + L and hold it in for at least five seconds.*

SAFETY CONTROLS

After a Penalty brake application has occurred, normal locomotive operation is restored in the following manner:

1. *Move the Throttle to IDLE.*
2. *Move the Automatic Brake Handle to SUPPRESSION.*
3. *Wait at least ten seconds, then move the Automatic Brake Handle to RELEASE when ready.*

DYNAMIC BRAKE OPERATION

Applying Dynamic Brakes

Applying dynamic braking is done in the following manner:

1. *Move the Throttle to IDLE.*
2. *Advance the Dynamic Brake as desired.*
3. *After the slack is bunched, manipulate the Dynamic Brake until the desired braking effort is obtained. Observe and correct braking effort during the initial period of Dynamic Brake application.*

   The amount of braking effort obtainable varies with the position of the Dynamic Brake for various speeds. Maximum braking effort is obtained in the FULL BRAKING position at around 24 MPH.

Use Of Air Brakes During Dynamic Braking

NOTE: Use of independent air brake does not affect the braking effort from dynamic brake. Independent brake and dynamic brake can be applied at the same time with no reduction in either braking capability.

When necessary, the automatic air brake may be used in conjunction with the dynamic brake.

CREDITS

Thank you to our entire team, all our beta testers, our scenario writer, our network engineer and JointedRail.

For proper support inquiries related to this product and or others, please use our support form on the our website or directly contact us at support@searchlight-simulations.com .

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