

EN

TRAIN SIM WORLD 2



CANE CREEK



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1 CANE CREEK OVERVIEW

The Cane Creek route, developed for Train Sim World 2 by Skyhook Games, re-creates Union Pacific's Cane Creek Subdivision, also known as the Cane Creek Branch. Widely renowned for its extraordinary rugged and remote western desert scenery, the Cane Creek Subdivision extends from a connection with Union Pacific's Green River Subdivision at Brendel, Utah south to Potash, Utah, 35.8 route miles. As created for TSW2, the route also includes a five-mile section of the Green River Subdivision east from Brendel to Thompson, Utah.

By American railroad standards, the Cane Creek Branch is a newcomer. In the late 1950s, plans took form to tap the massive potash deposits found along the Colorado River in eastern Utah. By 1960, development of what would evolve into today's sprawling potash mine and processing facility south of Moab and near Cane Creek were rapidly taking form, and the Denver & Rio Grande Western (D&RGW, or simply the "Rio Grande") agreed to build a new branch from its main line at Brendel (D&RGW was combined with the Southern Pacific in 1988 and merged into Union Pacific in 1996). Grading and construction of the new branch line was contracted to Morrison-Knudsen and work began in August 1961. M-K completed its work in September 1962 and D&RGW crews moved in to lay the tracks. Notable challenges during the building of the Cane Creek Branch were the boring of 7,059-foot Bootlegger Tunnel and excavating a 120-foot deep, 7000-foot-long deep cut through Moab Canyon.

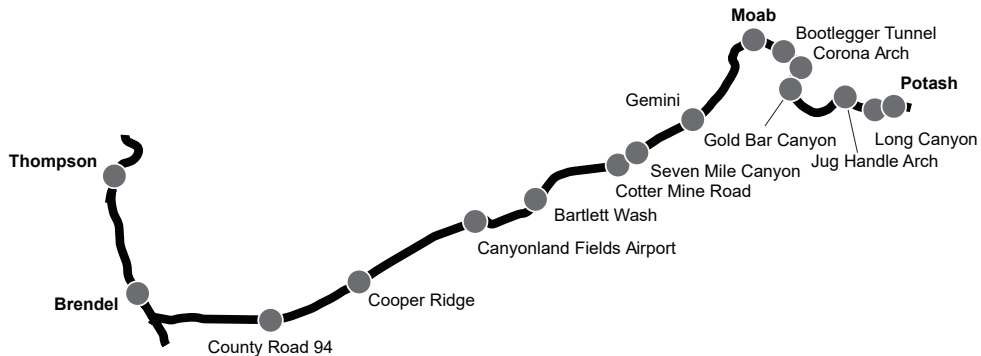
The potash mine and facility at the south end of the line began production in late 1964 and the branch was operated by D&RGW

as its Cane Creek Branch until the road's merger into Union Pacific. While there have been fluctuations in the amounts of potash being moved over the Cane Creek Branch, it has been in nearly continuous use since the 1960s.

Remarkably, the Cane Creek line gained a second purpose – and source of extensive tonnage – in 2008. Moab had long been the site of a Uranium mill which closed in 1984, leaving approximately 12 million tons of dirt tailings behind. While these tailings are only modestly radioactive, the risk of their erosion into the nearby Colorado River required eventually reclamation. Under the auspices of the United States Department of Energy, a burial site for the tailings was developed at Brendel and train loads of the contaminated soil began moving over the length of the Cane Creek Subdivision to Brendel. These movements are expected to continue until approximately 2028.

In addition to its truly remarkable western scenery, the Cane Creek Subdivision offers memorable railroading and operating challenges. From Potash to Brendel, the line climbs nearly a thousand feet in elevation over a "roller coaster" profile featuring frequent gradients of 1.2 percent and curves of up to 6 degrees. Given that both the potash and contaminated soil tonnage involves carrying loads northbound, the climb from Potash and Moab to Brendel requires plenty of horsepower and Union Pacific regularly employs six-axle power, such as the General Electric AC4400CW and Electro-Motive SD40-2 included with the TSW2 route.

5 ROUTE MAP & POINTS OF INTEREST



MAINLINE SECTION: THOMPSON - BRENDEL

Along the north end of the route, you get to experience a few miles of high speed mainline action as you run from Thompson to Brendel on Union Pacific's Green River Subdivision. This part of the route is a single-track mainline with passing sidings and C.T.C. operations ("Centralized Traffic Control").

A small yard, a signaled passing siding, and a wye can be found at Thompson.

Brendel has another signaled passing siding and a couple of team tracks. It is also the site of a yard that was newly constructed for the cleanup operations of the contaminated mill tailings from Moab.

CANE CREEK BRANCHLINE: BRENDEL - POTASH

The Cane Creek Branch splits off the Green River Sub at Brendel and heads south from there towards the Colorado River. The branch line measures 37 miles in length between the junction at Brendel at the end of the line at Potash.

The small yard of Seven Mile, which includes three spur tracks, is located at mile post 21.3 on the branch. The next "station" on the line is Emkay at mile post 28.1, which is where the trains for the Moab mill tailings cleanup operation are headed. Finally, at mile post 35.8, we reach the yard of Potash.

The entire Cane Creek Branch is unswitched south of Brendel and operated under Track Warrant Control (T.W.C.), which is the modern form of train order operations in which train movements are governed solely through orders received from the subdivision dispatcher by radio.

All switches on the branchline are manual and have to be operated by the train crew.

Maximum permitted speed on the branch line is 25 mph, with a few miles of slower posted speeds.

JOURNEYS

Blends together more than 24 hours of sequential gameplay. Start a Journey and enjoy hundreds of scenarios, timetabled services, and jobs to complete around the railway.

TRAINING

Training modules give you the knowledge you need to get the most from your locomotives and trains via interactive lessons that teach you key concepts. If you're new to Train Sim World, we recommend you start here to learn the fundamentals.


SCENARIOS

Scenarios are objective-based activities which provide unique experiences. Move coaches around, drive passenger and freight services and experience some of the operations that occur on the route.

TIMETABLES

These provide a host of activities throughout an entire 24-hour time period; Timetable Mode is a new way to play. There's always something to do with a large variety of services to take control of or ride along with. Sit back and enjoy the action and capture amazing screenshots, hop on or off and ride along with the various services as they go about their duties or take control and carry out the duties yourself. Featuring many individual services, you'll always find something going on.





2 UNION PACIFIC GE AC4400CW

INTRODUCING THE AC4400CW

9

Constructed by General Electric, the 4,400-horsepower, A.C.-traction-equipped AC4400CW is a landmark railroad workhorse with more than 2,500 units produced between 1983 and 2004.

By far the type's most active buyer, Union Pacific purchased nearly 1,300 AC4400CWs between 1994 and 2004. And as with the SD40-2, mergers brought more AC4400CWs to the UP, with Southern Pacific and Chicago & North Western contributing more than 300 additional units. Union Pacific has begun to rebuild and upgrade its massive fleet of AC4400CWs, which are expected to remain in front-line Union Pacific service for many years to come.



10 AC4400CW ENGINEER'S CAB



A

B

B

C

D

E

F

Panels artificially brightened for clarity



Panels artificially brightened for clarity



IMPORTANT ENGINE INFORMATION
THIS ENGINE IS A TWIN CYLINDER
TWIN ENGINE TYPE ENGINE & OPERATES
AS IF BE MANIPULATED WITH THE PROCTOR
AND ADJUSTS TO A COORDINATE TO THE DRIVER
OPERATOR SERVICE MANUAL.

CAUTION
This engine is a twin cylinder
twin engine type engine & operates
as if be manipulated with the proctor
and adjusts to a coordinate to the driver
operator service manual.

WARNING
This engine is a twin cylinder
twin engine type engine & operates
as if be manipulated with the proctor
and adjusts to a coordinate to the driver
operator service manual.

**DANGER
600 VOLTS**

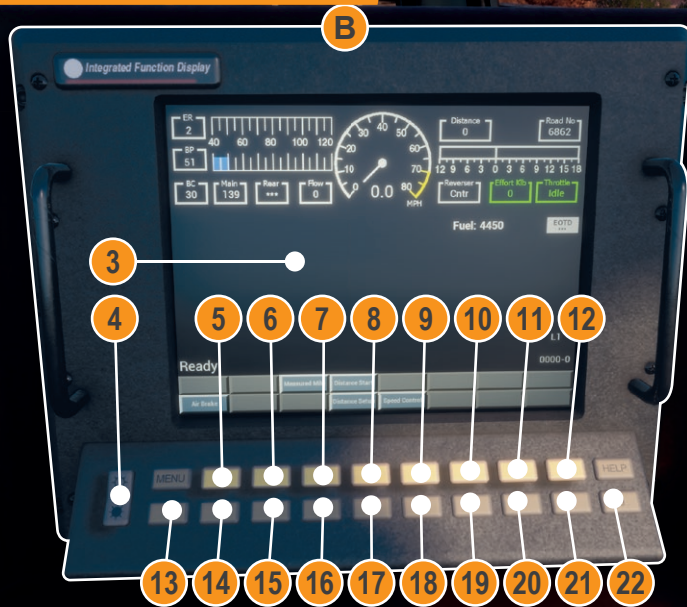
**DANGER
600 VOLTS**

AC4400CW ENGINEER'S CAB: PANEL A



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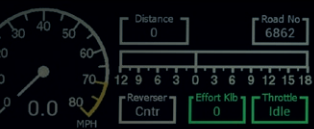
14 AC4400CW ENGINEER'S CAB: PANEL B



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AC4400CW ENGINEER'S CAB: PANELS C & D

15



Fuel: 4450

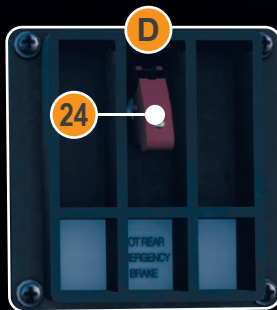
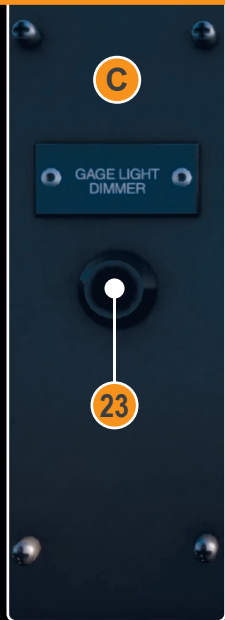
EOTD

L1

0000-0

Start
Setup Speed Control

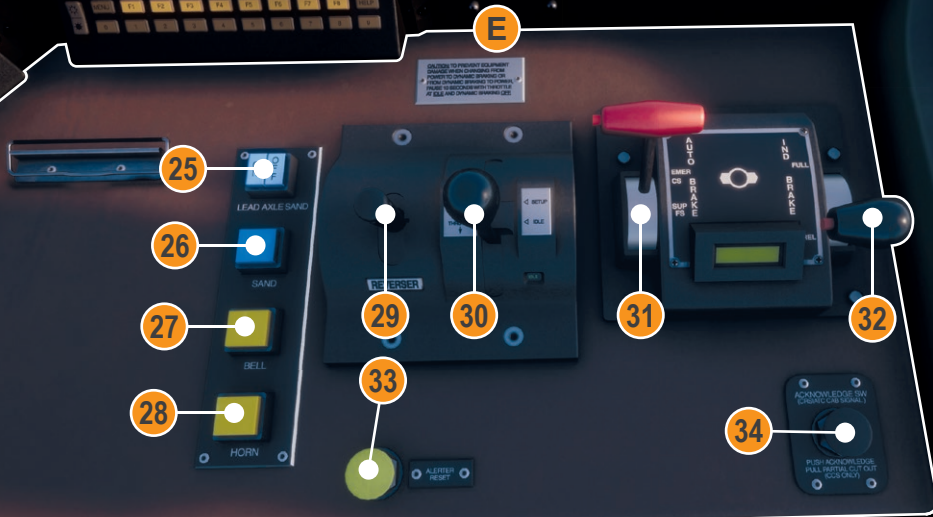
F5 F6 F7 F8 HELP
6 7 8 9



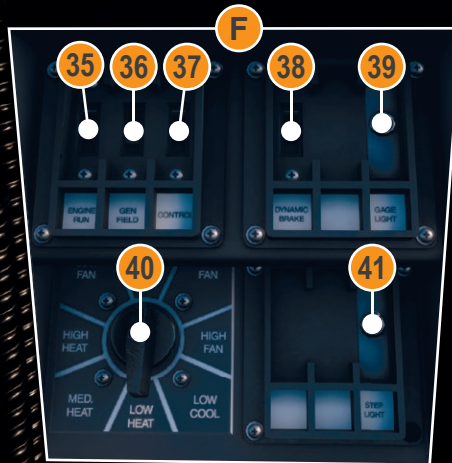
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CAUTION: TO PREVENT EQUIPMENT DAMAGE WHEN CHANGING FROM

16 AC4400CW ENGINEER'S CAB: PANEL E



Panels artificially brightened for clarity



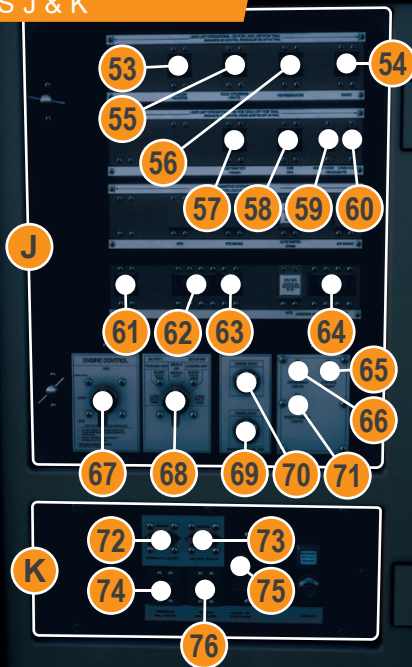
Panels artificially brightened for clarity



18 AC4400CW ENGINEER'S CAB: PANELS G & H



Panels artificially brightened for clarity



IMPORTANT ENGINE INFORMATION
THIS ENGINE HAS TWO COMPRESSORS
AND TWO TURBOCHARGERS. ALWAYS
REFER TO THE OPERATOR'S MANUAL FOR
OPERATION AND MAINTENANCE.

CAUTION
HOT SURFACES
DO NOT TOUCH
HOT SURFACES
MAY BE HOT ENOUGH TO CAUSE
BURNS. ALWAYS USE PROPER
OPERATION PROCEDURES.

WARNING
HIGH VOLTAGE
DO NOT TOUCH
HIGH VOLTAGE
ELECTRICAL COMPONENTS
MAY BE HOT ENOUGH TO CAUSE
BURNS. ALWAYS USE PROPER
OPERATION PROCEDURES.

DANGER
600 VOLTS

FULL
FRA 2

A HEADLIGHT CONTROL

- 1 Sets the state of the forward headlight.
- 2 Sets the state of the rear headlight.

B INTEGRATED FUNCTION DISPLAYS

- 3 The Integrated Function Display (IFD) enables control over locomotive functions.
- 4 Increases or Decreases the brightness of the IFD (non-functional).
- 5 Function Key 1 (F1). Selects the option displayed in the F1 position on the IFD Option Menu shown at the bottom of the display.
- 6 Function Key 2 (F2). Selects the option displayed in the F2 position on the IFD Option Menu shown at the bottom of the display.
- 7 Function Key 3 (F3). Selects the option displayed in the F3 position on the IFD Option Menu shown at the bottom of the display.
- 8 Function Key 4 (F4). Selects the option displayed in the F4 position on the IFD Option Menu shown at the bottom of the display.
- 9 Function Key 5 (F5). Selects the option displayed in the F5 position on the IFD Option Menu shown at the bottom of the display.
- 10 Function Key 6 (F6). Selects the option displayed in the F6 position on the IFD Option Menu shown at the bottom of the display.
- 11 Function Key 7 (F7). Selects the option displayed in the F7 position on the IFD Option Menu shown at the bottom of the display.
- 12 Function Key 8 (F8). Selects the option displayed in the F8 position on the IFD Option Menu shown at the bottom of the display.
- 13 Numeric Entry Key 0.
- 14 Numeric Entry Key 1. Also serves as Option Key 1. Selects the option displayed in the 1 position on the IFD.

B INTEGRATED FUNCTION DISPLAYS CONTINUED

- 15 Numeric Entry Key 2. Also selects the option displayed in the 2 position on the IFD.
- 16 Numeric Entry Key 3. Also selects the option displayed in the 3 position on the IFD.
- 17 Numeric Entry Key 4. Also selects the option displayed in the 4 position on the IFD.
- 18 Numeric Entry Key 5. Also selects the option displayed in the 5 position on the IFD.
- 19 Numeric Entry Key 6. Also selects the option displayed in the 6 position on the IFD.
- 20 Numeric Entry Key 7. Also selects the option displayed in the 7 position on the IFD.
- 21 Numeric Entry Key 8. Also selects the option displayed in the 8 position on the IFD.
- 22 Numeric Entry Key 9. Also selects the option displayed in the 9 position on the IFD.

C GAUGE LIGHTING CONTROL

- 23 Dims / Brightens the Gauge Back Lighting.

D END OF TRAIN DEVICE

- 24 Sets the state of the End of Train Device Emergency function.

E MAIN CONTROL DESK

- 25 Sets the state of the Lead Axle Sanding equipment (places sand ahead of the lead axle thus aiding adhesion of the powered axles).
- 26 Sets the state of the Sanding Equipment (places sand at all axles).
- 27 Sets the state of the Locomotive Warning Bell.
- 28 Sets the state of the Locomotive's Warning Horn.
- 29 Reverser sets the direction of travel.
- 30 Throttle lever increases / decreases propelling in the direction set. It is also used to control the Dynamic Brake

E MAIN CONTROL DESK CONTINUED

- 31 Auto Brake sets the state of the air brakes throughout the consist.
- 32 Independent Brake sets the state of the locomotive's air brake only.
- 33 Resets the Alerter.
- 34 Acknowledges Cab Signal Alert (Inop.)

F SYSTEM CONTROLS

- 35 Engine Run enables direct engine speed control.
- 36 Generator Field enables power control.
- 37 Engine Control and Fuel Pump provides power to various low voltage control circuits.
- 38 Dynamic Brake enables control of the dynamic brake.
- 39 Sets the state of the Gauge Back Lighting.
- 40 Sets the state of the engineer's climate control fan.
- 41 Sets the state of the Step Lights.

G OVERHEAD CONTROLS

- 42 The Engineer's Radio (used in to communicate with Helper/DPU Locomotive(s)).
- 43 Deactivates Helper/DPU Communications.
- 44 Adjusts the volume of the Helper Communications.
- 45 Push to Talk button communicates with the Helper/DPU Locomotive(s).
- 46 Dims the desk light.
- 47 Sets the state of the desk light.
- 48 Sets the speed of the Engineer's Fan.

G OVERHEAD CONTROLS CONTINUED

- 49 Sets the state of the Engineer's Fan.

H WINDSHIELD WIPER CONTROLS

- 50 Sets the state of the Engineer's forward windshield wipers.
- 51 Sets the state of the Engineer's rear windshield wipers.
- 52 Sets the state of the Cab Light.

J CIRCUIT BREAKER CONTROLS

- 53 Sets the state of the MCB for the Window Heater.
- 54 Sets the state of the MCB for the Radio.
- 55 Sets the state of the MCB for the Road Crossing Lights.
- 56 Sets the state of the MCB for the Refrigerator.
- 57 Sets the state of the MCB for the Distributed Power Unit Control.
- 58 Sets the state of the MCB for the Cab Fan.
- 59 Sets the state of the MCB for the Short Hood Headlights.
- 60 Sets the state of the MCB for the Long Hood Headlights.
- 61 Sets the state of the MCB for the Running Lights.
- 62 Sets the state of the MCB for the Fuel Pump.
- 63 Sets the state of the MCB for Local Control.
- 64 Sets the state of the MCB for the Cab and IFDs.
- 65 Sets the state of the Control Components.
- 66 Sets the state of the Crosswalk Lights.

J CIRCUIT BREAKER CONTROLS CONTINUED

- 67 Engine Control switch sets the state of the Engine Control System.
- 68 Sets the state of the running lights in a multi-unit lash up.
- 69 Stops the diesel engine.
- 70 Starts the diesel engine.
- 71 Sets the state of the Front Number Lights.

K HEATING CONTROLS

- 72 Sets the state of the Engineer's Heater.
- 73 Sets the state of the Helper's Heater.
- 74 Sets the state of the MCB for the Engineer's Wall Heater.
- 75 Sets the state of the MCB for the Heater / Air Conditioner.
- 76 Sets the state of the MCB for the Helper's Wall Heater.



3 OPERATING THE UNION PACIFIC GE AC4400CW

Starting an AC4400CW from a cold and dark state (fully switched off) is an easy process as explained below:

Note: We've highlighted switches/controls to interact with using a simple reference code. The leading letter refers to the panel and the number refers to the switch/control on that panel, as shown on pages 20 to 23. For example A5 means refer to Panel A, and it's the control labelled 5 in our image (pages 10 to 19).

1. Check that the Handbrake is applied - the wheel is located on the outside of the cab, on the long-hood end of the locomotive.
2. Enter the Forward Driving Cab (the cab you will be operating from).
4. Set the following MCBs to On:
 - Fuel Pump (J62)
 - Local Control (J63)
5. Turn the Engine Control switch (J67) to Start.
6. Press and Hold the Engine Start Switch (J70) until the engine catches and begins to idle.
7. Turn the Engine Control switch (J67) to Run.
8. Set the following MCBs to On:
 - Cab/Display Computer (J64).
 - Running Lights (J61).
 - Short Hood Headlights (J59).
 - Long Hood Headlights (J60).
 - Radio (J54).
 - Additional MCBs as required.
9. Sit in the Engineer's Seat.
10. Set the following switches to On:
 - Engine Run (F35).
 - Generator Field (F36).
 - Control (F37).
 - Dynamic Brake (F38).
 - Gauge Lights (F39).
11. Set the Forward Headlights to Bright (A1).
12. On any of the IFDs (B), press Option Key 1 (B14), then Function Key 3 (B7), then Function Key 4 (B8), then Function Key 6 (B10) and finally, Function Key 8 (B12).
13. Leave the Engineer's Seat, and go outside and set the Handbrake to Released, then, return to the Engineer's Seat and ensure the access door is closed behind you.
14. Move the Reverser (E29) to Forward.
15. Move the Independent Brake (E32) to Release.
16. Move the Auto Brake (E31) to Release.
17. Move the Throttle (E30) to the first notch to begin applying power. The loco should begin to move unless you have more weight in the consist than can be overcome with a small amount of throttle. You may need to advance the throttle to a higher position to get the loco moving.

The AC4400CW, like many American Locomotives, has four types of brakes fitted.

The Throttle Lever, when moved forward, controls the Dynamic Brake (also called a Rheostatic Brake) which essentially turns the traction motors into generators. The act of generating electricity creates a substantial amount of resistance and this is what slows the train. Unlike regenerative brakes, which transmits the electricity generated by the traction motors back to the power supply grid, the electricity generated by the traction motors is instead transmitted to a bank of onboard resistors (called a braking grid) and it is again converted by the resistors to heat. This type of conversion generates substantial amounts of heat which is discharged by large powerful fans.

The dynamic brake is particularly useful for slowing long trains and is often used as a trim brake - adjusting the speed of a consist in small increments. The dynamic brake is only effective to a certain degree and, much like similar types of traction motor braking system found throughout the world, are completely ineffective below a certain speed - usually around 15 to 25 mph.

Use the Auto Brake handle to control the air brakes of the entire consist. This type of brake affects each vehicle in the consist as the air travels along its length, applying the brakes consecutively to the pressure set by the brake valve.

Use the Independent Brake handle (also called a straight air brake) to control the brakes on the locomotive only. This brake is typically used as a temporary stabilising brake or when operating in very small consists such as one or two locomotives lashed together. Care should be taken not to overuse the Independent Brake as it can rapidly overheat the brakes on the locomotive thus reducing their effectiveness and causes excessive wear to the brake components (not simulated).

The fourth and final brake is the handbrake - which is used when the locomotive is going to be stationary for a while.

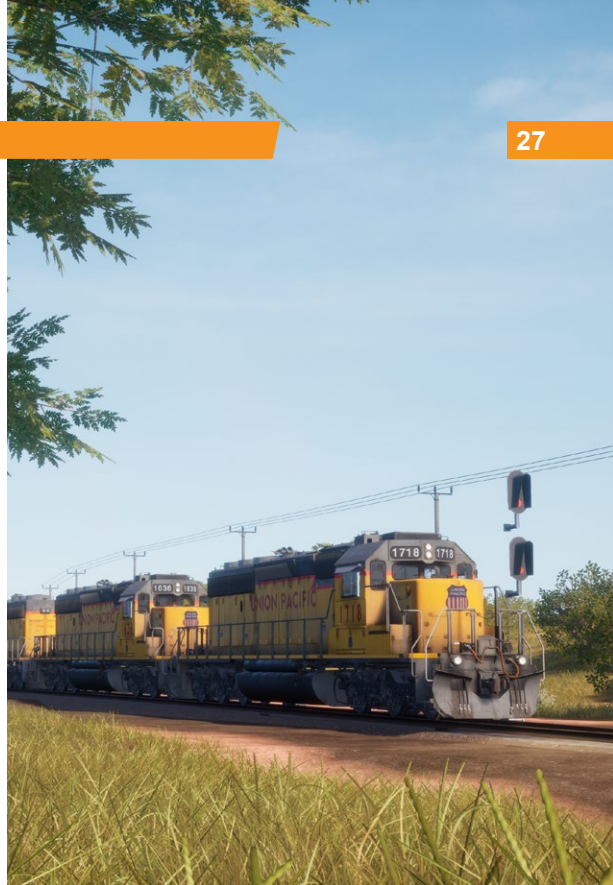


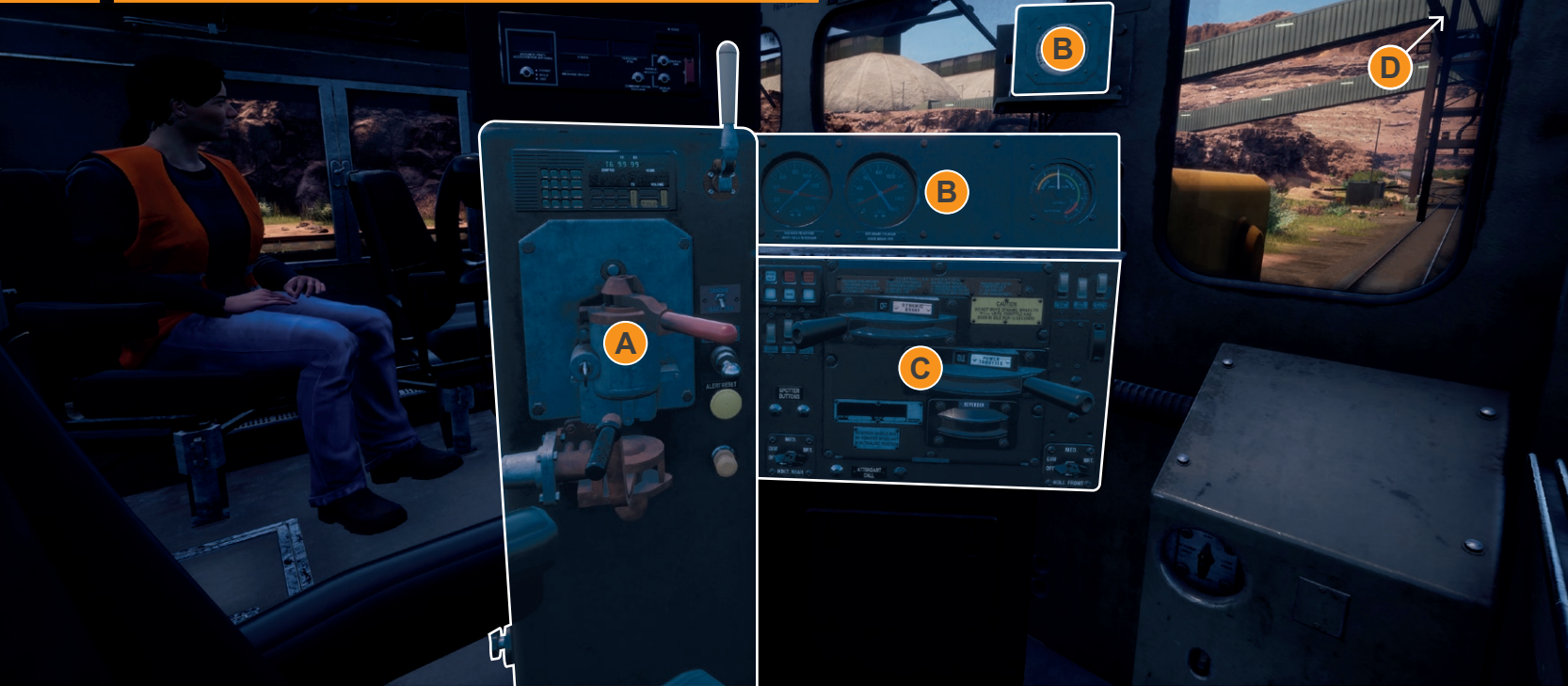
4 UNION PACIFIC EMD SD40-2

INTRODUCING THE SD40-2

27

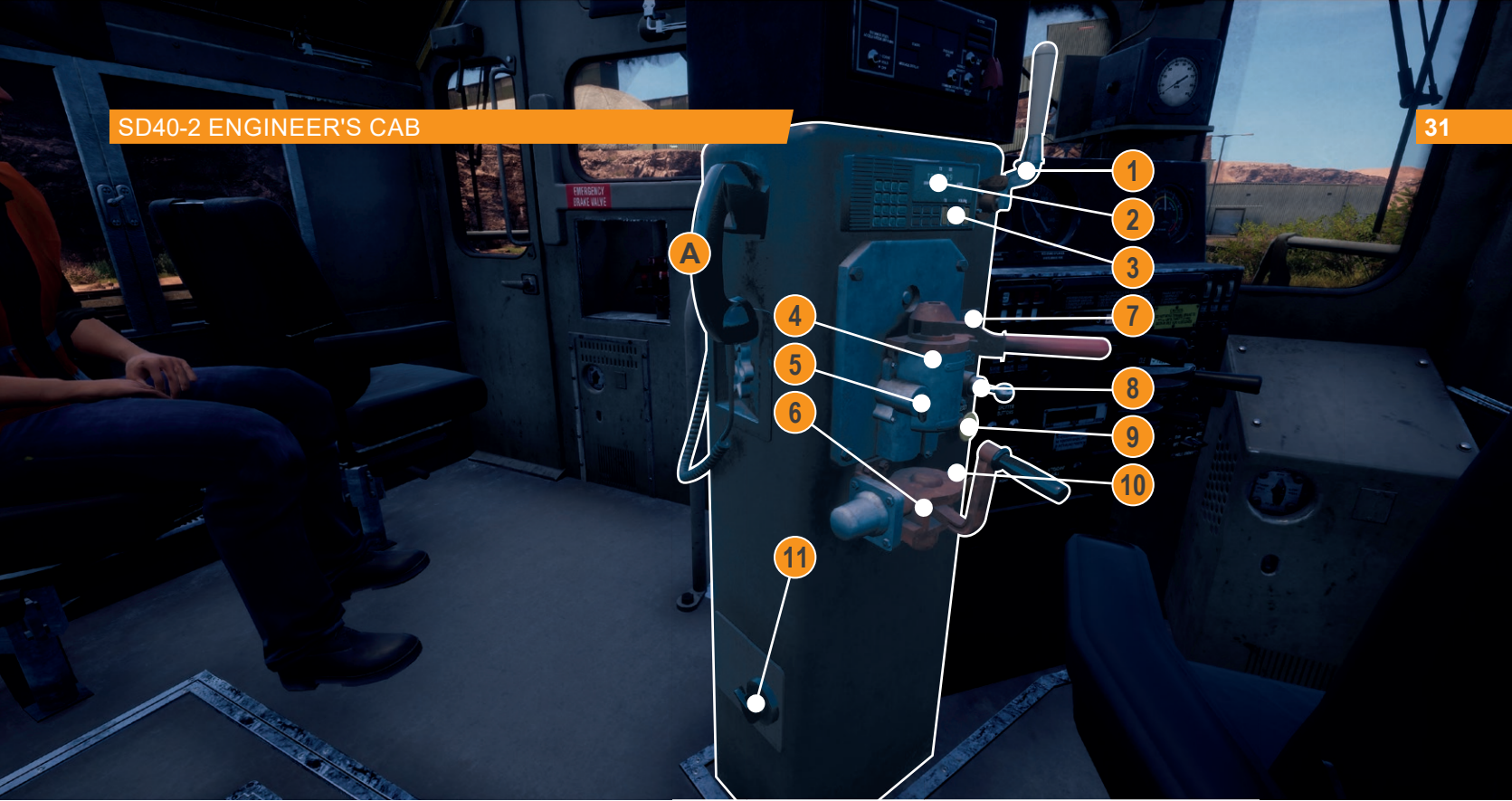
The 3,000-horsepower Electro-Motive SD40-2 debuted in 1972 and in a production run that continued through 1986, EMD produced nearly 4,000 SD40-2s, making the locomotive one of the most successful of all time. The SD40-2 was purchased by 24 North American railroads and among the largest buyers was Union Pacific. Between 1972 and 1980, UP purchased 579 SD40-2s, and the railroad's fleet of the versatile diesel grew even larger via UP's mergers with Missouri Pacific, Chicago & North Western, and Katy, which together added nearly 500 more SD40-2s to Union Pacific's roster. Today, the Union Pacific continues to operate a large fleet of the now veteran diesels which have been upgraded in a rebuilding program at Union Pacific's Jenks Locomotive Facility in North Little Rock, Arkansas. Union Pacific classifies with rebuilt SD40-2s as the SD40N.







SD40-2 ENGINEER'S CAB



A

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10

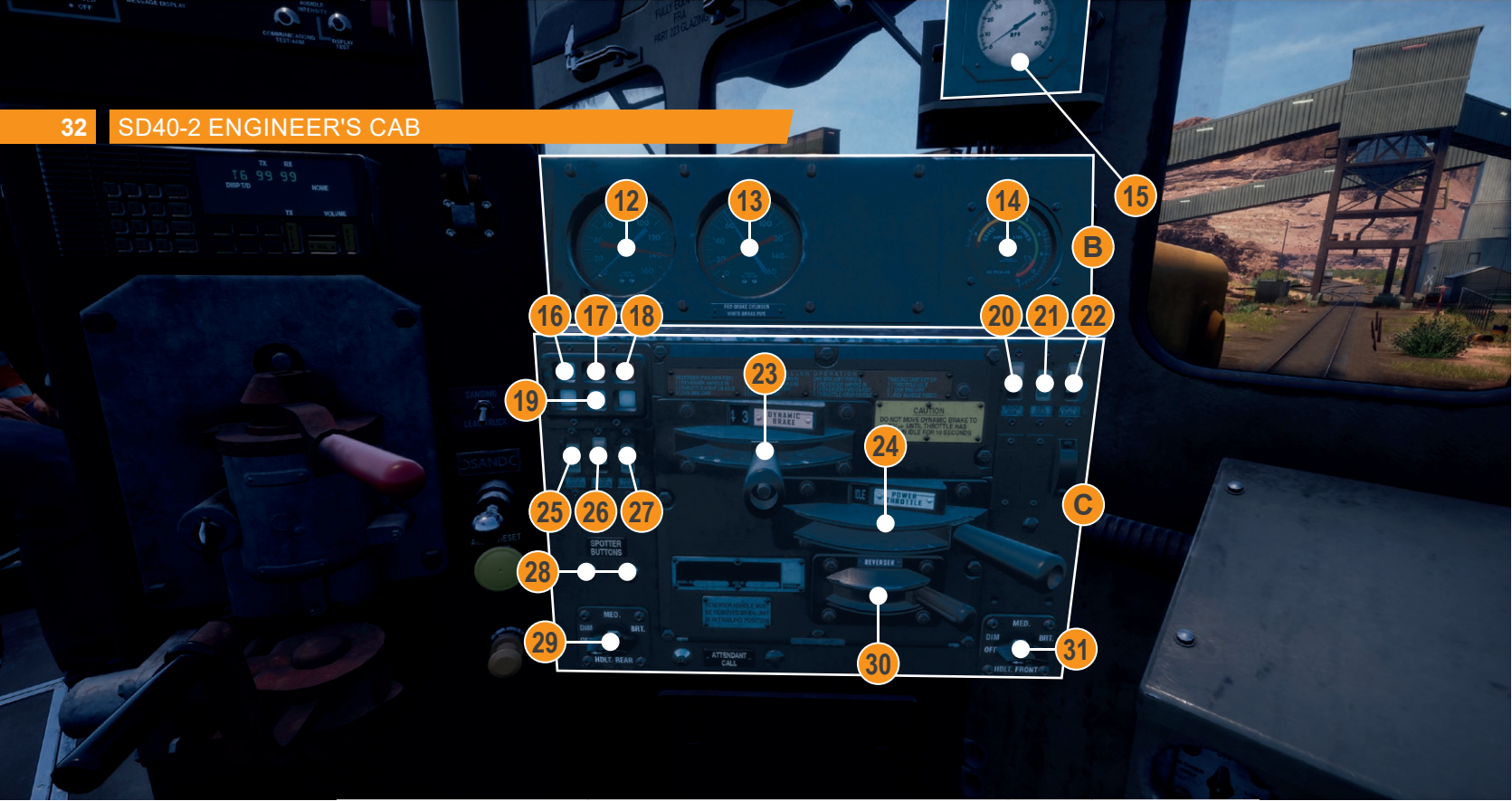
4

5

6

11

EMERGENCY
BRAKE VALVE



12

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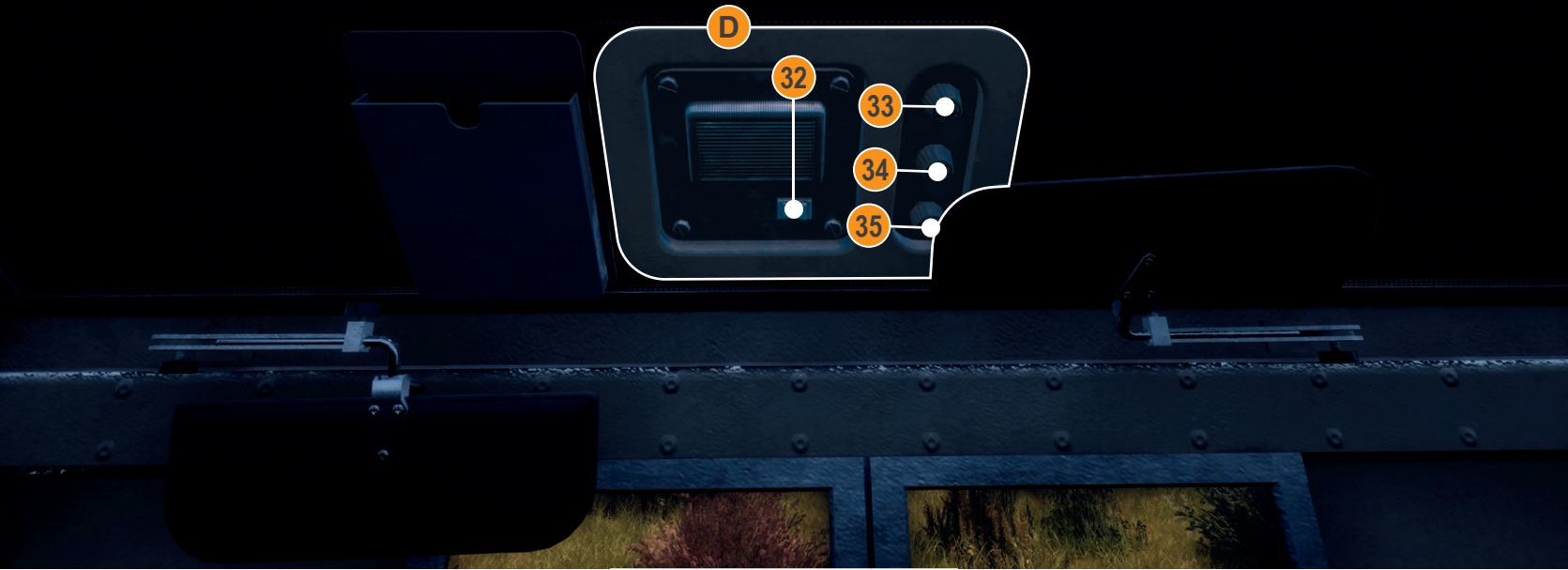
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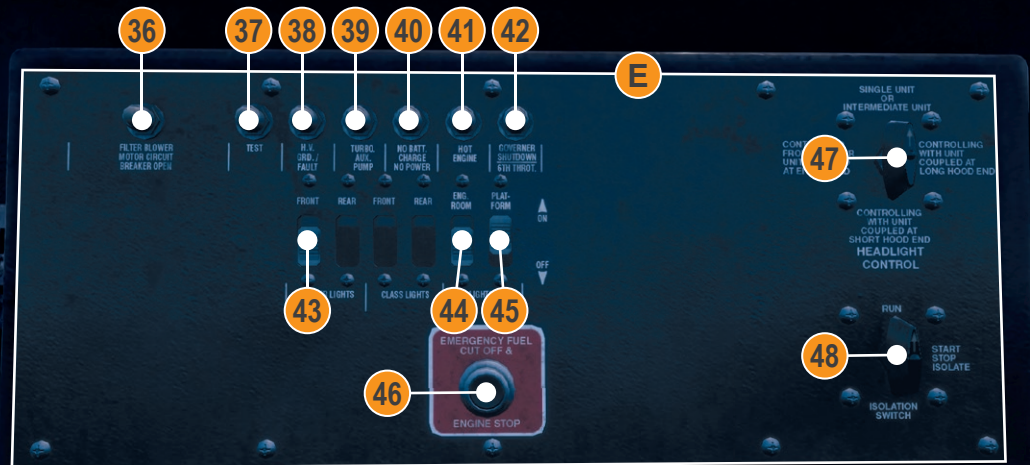
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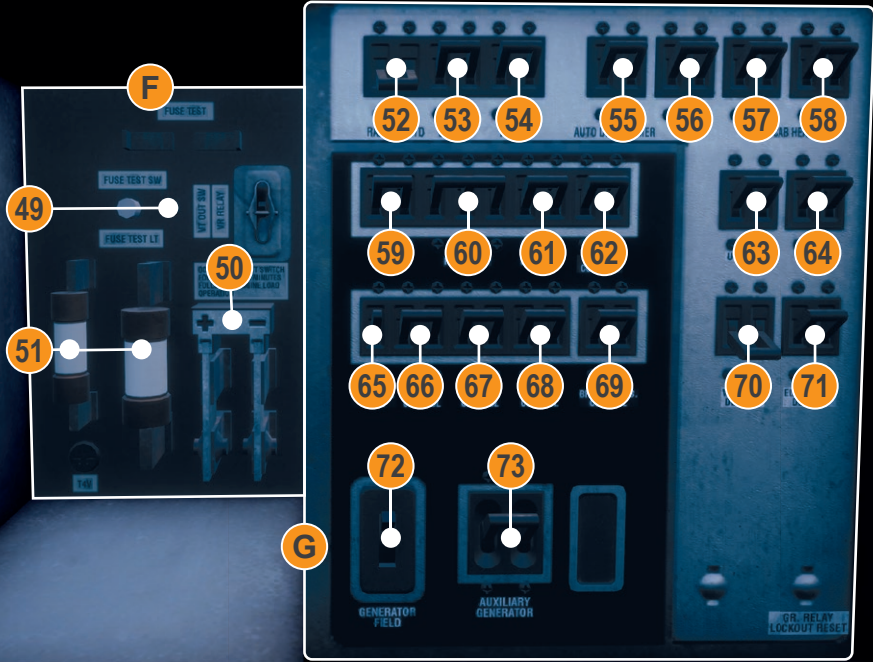
31

B

C







A MAIN CONTROL STAND: BRAKE CONTROLS

- 1 Sets the state of the Locomotive's Warning Horn.
- 2 The Engineer's Radio (used to communicate with Helper/DPU Locomotive(s)).
- 3 Switches enable communication with Helper/DPU Locomotive(s).
- 4 Auto Brake sets the state of the air brakes throughout the consist.
- 5 Brake Cut-Off Valve isolates this locomotive's brake control when used in Multiple Working configurations.
- 6 Independent Brake sets the state of the locomotive's air brake only.
- 7 Sets the state of the Lead Axle Sanding equipment (places sand ahead of the lead axle thus aiding adhesion of the powered axles).
- 8 Sets the state of the Sanding Equipment.
- 9 Resets the Alerter, the engineer's vigilance device.
- 10 Sets the state of the Locomotive Warning Bell.
- 11 The Multiple Unit (MU-2A) Valve sets the state of the control stand when in Multiple Working configurations.

B GAUGES

- 12 Air Brake Gauge indicating the Main Reservoir (Red) and Air Equalizing Reservoir (White) Pressures in PSI. This gauge shows how much air you have available.
- 13 Air Brake Gauge indicating the Brake Cylinder (Red) and Brake Pipe (White) Pressures in PSI. This gauge shows how much force is actually being applied.
- 14 Load Current Meter (Ammeter) indicates the locomotive's pulling force (or brake force as generated by the dynamic braking system) in Amps.
- 15 Speedometer displays the locomotive's current speed in mph.

C MAIN CONTROL STAND: OPERATING CONTROLS

- 16 The Wheel Slip indicator is lit when the locomotive's driving wheels are losing adhesion with the rail head. Either reduce throttle or apply sand.
- 17 The Pneumatic Control Switch (PCS) Open indicator is lit when an emergency or safety control air brake application occurs. The reset procedure must be carried out before control of the brakes are restored (see page XX).
- 18 The Brake Warning indicator is lit when excessive current is being generated by the dynamic brake. Reduce the dynamic braking effort to clear the warning.
- 19 The Sand indicator is lit when sand is being applied to the lead axle. It does not indicate a fault and is not lit when using manual, emergency or wheel slip sanding.
- 20 Engine Run is the first of three operating switches and must be on to obtain control of engine speed.
- 21 Gen. Field is the second of three operating switches and must be on to obtain power from the locomotive.
- 22 Control & Fuel P. is the third of three operating switches and provides power to various low voltage control circuits. The switch must be on to start the diesel engine and operate the fuel pump.
- 23 Dynamic Brake Lever is used to increase or reduce the locomotive's dynamic brake.
- 24 Throttle Lever is used to increase or reduce power to propel the locomotive in the direction set by the Reverser (C30).
- 25 Sets the state of the Ditch Lights.
- 26 Sets the state of the Step Lighting.
- 27 Sets the state of the Gauge Back Lighting.
- 28 Spotter Buttons uses the onboard battery to propel the locomotive in the direction of the appropriate button. These buttons can only be used when the diesel engine is not started.

C MAIN CONTROL STAND: OPERATING CONTROLS CONTINUED

- 29 Sets the state of the Rear Headlights.
- 30 Reverser sets the direction the locomotive will move in when power is applied.
- 31 Sets the state of the Forward Headlights.

D WINDSHIELD WIPER CONTROLS

- 32 Sets the state of the Engineer's Cab Light.
- 33 Sets the state of the Engineer's Forward Windshield Wiper.
- 34 Sets the state of the Forward Central Windshield Wipers.
- 35 Sets the state of the Engineer's Rear Windshield Wiper (Cab Access Door).

E MISCELLANEOUS CONTROLS

- 36 Filter Blower Motor Circuit Breaker Open Warning Indicator (Inop.)
- 37 Test Warning Indicator (Inop.)
- 38 High Voltage Ground Fault Warning Indicator (Inop.)
- 39 Turbocharger Auxiliary Oil Pump Warning Indicator (Inop.)
- 40 No Battery Charge / No Power Warning Indicator (Inop.)
- 41 Hot Engine Warning Indicator (Inop.)
- 42 Governor Shutdown Warning Indicator (Inop.)
- 43 Sets the state of the Forward Number Lights.
- 44 Sets the state of the Engine Room Lights.
- 45 Sets the state of the Platform Lights.
- 46 Emergency Fuel Cut Off & Engine Stop button.

E MISCELLANEOUS CONTROLS CONTINUED

- 47 Sets the locomotive control state for multiple working.
- 48 Engine Isolation Switch is used when starting the diesel engine.

F FUSE PANEL

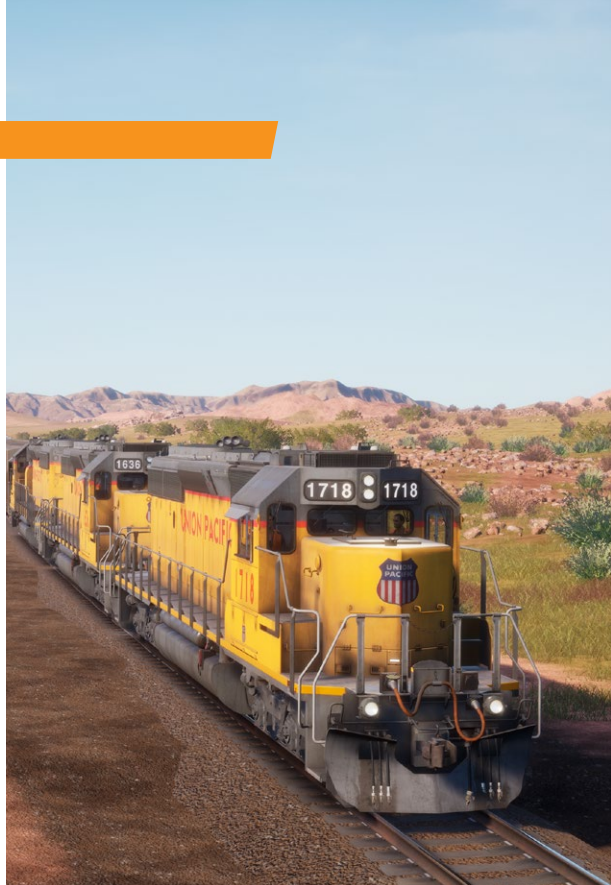
- 49 Fuse Test Switch is used to test the cartridge fuses used in the electrical system.
- 50 Main Battery Knife Switch sets the state of the battery to the low voltage circuit.
- 51 Cartridge Fuses protect against excessive current demands. The larger 400A fuse is only used when starting the diesel engine, it has no effect on locomotive function. The smaller 150A fuse connects the auxiliary generator to the low voltage circuit.

G CIRCUIT BREAKERS

- 52 Radio & Head of Train Device Circuit Breaker (Panel A).
- 53 Lights Circuit Breaker (Panels C & E).
- 54 Headlights Circuit Breaker (Panel C).
- 55 Auto Water Drain Circuit Breaker (Not Simulated).
- 56 No Function.
- 57 Auxiliary Cab Heater Circuit Breaker.
- 58 Auxiliary Cab Heater Circuit Breaker.
- 59 Turbocharger Oil Pump Circuit Breaker.
- 60 Fuel Pump Circuit Breaker.
- 61 Starting Control Circuit Breaker.
- 62 Local Control Circuit Breaker (Panel C).
- 63 Utilities Control Circuit Breaker (Panels A & B).

G CIRCUIT BREAKERS

- 64 No Function.
- 65 Auxiliary Generator Field Excitation Circuit Breaker.
- 66 Electrical Module Circuit Breaker.
- 67 Reversing Control Circuit Breaker.
- 68 Alternator (D14) Control Circuit Breaker.
- 69 Brake Transfer Control Circuit Breaker (Dynamic Brake).
- 70 Warning Devices Circuit Breaker.
- 71 Electronic Devices Circuit Breaker.
- 72 Generator (AR10) Field Circuit Breaker.
- 73 Auxiliary Generator Field Circuit Breaker.



5 OPERATING THE UNION PACIFIC EMD SD40-2

Starting an SD40-2 from a cold and dark state (fully switched off) is an easy process as explained below:

Note: We've highlighted switches/controls to interact with using a simple reference code. The leading letter refers to the panel and the number refers to the switch/control on that panel, as shown on pages 20 to 23. For example A5 means refer to Panel A, and it's the control labelled 5 in our image (pages 10 to 19).

1. Check that the Handbrake is applied - the wheel is located on the outside of the cab, on the short-hood end of the locomotive.
2. Enter the Forward Driving Cab (the cab you will be operating from).
4. Ensure all Circuit Breakers are set to On (Up).¹
5. Set the Main Battery Knife Switch (F50) to On.
6. Turn the Engine Control switch (E48) to Start/Stop/Isolate.
7. Set the following switches to On (Up):
 - Engine Run (C20),
 - Gen Field (C21),
 - Control & Field (C22),
 - Engine Room Light (E44).
8. Move to the gangway, on the Engineer's Side and locate the engine room latches - and open the engine room doors.
9. Rotate the Engine Prime/Start switch counterclockwise for 5 to 10 seconds.
10. Rotate the Engine Prime/Start switch clockwise to the start position and hold until the engine catches. Release when the engine begins to idle.
11. Turn the Engine Control switch (E48) to Run.
12. Sit in the Engineer's Seat.
13. Set the Gauge Lights to On (C27).
14. Set the Forward Headlights to Bright (C31).
15. Set the Cut-Off Valve to Freight (A5).
16. Set the MU-2A Valve to Lead or Dead (A11).
17. Leave the Engineer's Seat, and go outside and set the Handbrake to Released, then, return to the Engineer's Seat and ensure the access door is closed behind you.
18. Insert the Reverser Handle by clicking on the empty space, then move the Reverser (C30) to Forward.
19. Move the Independent Brake (A6) to Release.
20. Move the Auto Brake (A4) to Release.
21. Move the Throttle (C24) to the first notch to begin applying power. The loco should begin to move unless you have more weight in the consist than can be overcome with a small amount of throttle. You may need to advance the throttle to a higher position to get the loco moving.

The SD40-2, like many American Locomotives, has four types of brakes fitted.

The Dynamic Brake Lever controls the Dynamic Brake (also called a Rheostatic Brake) which essentially turns the traction motors into generators. The act of generating electricity creates a substantial amount of resistance and this is what slows the train. Unlike regenerative brakes, which transmits the electricity generated by the traction motors back to the power supply grid, the electricity generated by the traction motors is instead transmitted to a bank of onboard resistors (called a braking grid) and it is again converted to heat. This type of conversion generates substantial amounts of heat which is discharged by large powerful fans.

The dynamic brake is particularly useful for slowing long trains and is often used as a trim brake - adjusting the speed of a consist in small increments. The dynamic brake is only effective to a certain degree and, much like similar types of traction motor braking system found throughout the world, are completely ineffective below a certain speed - usually around 15 to 25 mph.

Unlike the other brake types, you need to follow a process to set-up the dynamic before you can apply braking effort. To use the Dynamic Brake follow the steps below:

1. Return the Throttle Lever to the Idle position and wait 10 seconds.

2. Move the Dynamic Brake Lever to the Set Up position. It is considered to be respectful to your locomotive (and good practice) to pause in the Set Up position before selecting an appropriate notch between 1 and FULL.
3. You can now select any Dynamic Brake notch position.

Use the Auto Brake handle to control the air brakes of the entire consist. This type of brake affects each vehicle in the consist as the air travels along its length, applying the brakes consecutively to the pressure set by the brake valve.

Use the Independent Brake handle (also called a straight air brake) to control the brakes on the locomotive only. This brake is typically used as a temporary stabilising brake or when operating in very small consists such as one or two locomotives lashed together. Care should be taken not to overuse the Independent Brake as it can rapidly overheat the brakes on the locomotive thus reducing their effectiveness and causes excessive wear to the brake components (not simulated).

The fourth and final brake is the handbrake - which is used when the locomotive is to be stabled or parked for an extended period of time.



6 CONFIGURING FOR MULTIPLE WORKING

The same rules and settings apply to the GE AC4400CW as for the EMD SD40-2. For the brake configuration, you should use the engineer's IFD to select the Air Brake screen and select the appropriate setup for each locomotive in the consist ensuring you save the configuration. The Operational Control Switches (F35, F36 and F37) consisting of Engine Run, Gen Field and Control perform the same functions as described for the EMD SD40-2 and must be set up following the same rules on each locomotive in the consist.

The above is also true for exterior lighting controls but there is a slight difference to the function of the lighting control switch on the GE AC4400CW.

To begin, you first need an understanding of the number of locomotives in the consist and where they are in the formation. If your formation is a typical x number of locomotives at the head of the train, then continue on. If you have x number of locomotives at the head of the train as well as x number of locomotives either at the tail of the train or in the middle, known as a Distributed Power consist, we will come back to this later.

For the purposes of this guide, we will use the following example of three locomotives at the head of the train as shown below:



We'll also assume that #1 is the lead locomotive, where you'll be operating from. For locomotive's #2 and #3 to provide power and braking assistance to the consist, we'll need to configure the locomotives as defined in the table below. As explained, the braking setup is configured in the engineer's IFD. The headlight control you will find on the rear bulkhead behind the engineer's seat:

LEAD LOCOMOTIVE

Auto Brake (IFD Air Brake Setup Screen)	CUT IN
Ind Brake (IFD Air Brake Setup Screen)	LEAD
Engine Run (F35)	ON
Gen Field (F36)	ON
Control (F37)	ON
Multiple Unit Headlight Setup Switch (J68)	SHORT HOOD LEAD

For each of the trailing locomotives in the consist, configure as shown in the tables on the following page.

TRAILING LOCOMOTIVE 2

Auto Brake (IFD Air Brake Setup Screen)	CUT OUT
Ind Brake (IFD Air Brake Setup Screen)	TRAIL
Engine Run (F35)	OFF
Gen Field (F36)	OFF
Control (F37)	OFF
Multiple Unit Headlight Setup Switch (J68)	SINGLE OR MIDDLE UNIT

TRAILING LOCOMOTIVE 3

Auto Brake (IFD Air Brake Setup Screen)	CUT OUT
Ind Brake (IFD Air Brake Setup Screen)	TRAIL
Engine Run (F35)	OFF
Gen Field (F36)	OFF
Control (F37)	OFF
Multiple Unit Headlight Setup Switch (J68)	SHORT HOOD TRAIL

If you did not want the two trailing locomotives to contribute power to the consist, for example when moving the three locomotives together without any freight cars, but you do want their braking assistance, you would configure as shown in the tables opposite:

LEAD LOCOMOTIVE

Auto Brake (IFD Air Brake Setup Screen)	CUT IN
Ind Brake (IFD Air Brake Setup Screen)	LEAD
Engine Run (F35)	ON
Gen Field (F36)	ON
Control (F37)	ON
Multiple Unit Headlight Setup Switch (J68)	SHORT HOOD LEAD

TRAILING LOCOMOTIVE 2

Auto Brake (IFD Air Brake Setup Screen)	CUT OUT
Ind Brake (IFD Air Brake Setup Screen)	TRAIL
Engine Run (F35)	ON
Gen Field (F36)	ON
Control (F37)	ON
Multiple Unit Headlight Setup Switch (J68)	SINGLE OR MIDDLE UNIT

TRAILING LOCOMOTIVE 3

Auto Brake (IFD Air Brake Setup Screen)	CUT OUT
Ind Brake (IFD Air Brake Setup Screen)	TRAIL
Engine Run (F35)	ON
Gen Field (F36)	ON
Control (F37)	ON
Multiple Unit Headlight Setup Switch (J68)	SHORT HOOD TRAIL

SD40-2 MULTIPLE WORKING CONFIGURATION

45

For the multiple working with the SD40-2, the configuration methodology is the same as with the AC4400CW, though the controls are different as there is no electronic display for you to utilise. Instead, the configuration is set via a series of valves.

Use the tables below to configure each locomotive in the consist. We'll move on to Distributed Power Units on the next page.

For the lead locomotive, the one you will be using to pilot the consist, you should always configure as below:

LEAD LOCOMOTIVE

Brake Valve (A5)	FREIGHT
MU-2A Valve (A11)	LEAD OR DEAD
Engine Run (C20)	ON
Gen Field (C21)	ON
Control (C22)	ON
Multiple Unit Headlight Setup Switch (E47)	CONTROLLING

Note for the Headlight Configuration, you will want to use the option that is relevant for your consist. If you have another locomotive coupled at the long hood end, use that option.

For trailing locomotives, you need to decide what role that locomotive is to play in the consist. You can define whether the locomotive has no power, no brakes or "dead in tow" - which is useful if you're hauling a completely unpowered locomotive.

TRAILING DEAD IN TOW

Brake Valve (A5)	CUT OUT
MU-2A Valve (A11)	LEAD OR DEAD
Engine Run (C20)	ON OR OFF
Gen Field (C21)	ON OR OFF
Control (F37)	ON OR OFF
Multiple Unit Headlight Setup Switch (J68)	CONTROLLED

TRAILING BRAKES ONLY

Brake Valve (A5)	CUT OUT
MU-2A Valve (A11)	TRAIL 6 OR 26
Engine Run (C20)	ON
Gen Field (C21)	ON
Control (C22)	ON
Multiple Unit Headlight Setup Switch (J68)	CONTROLLED

TRAILING POWER & BRAKES

Brake Valve (A5)	CUT OUT
MU-2A Valve (A11)	TRAIL 6 OR 26
Engine Run (C20)	OFF
Gen Field (C21)	OFF
Control (C22)	OFF
Multiple Unit Headlight Setup Switch (J68)	CONTROLLED

In Distributed Power Units or DPU, you have a consist that has locomotives that are not directly connected to each other, such as when you have a pair of locomotives at the front and another pair at the rear. This requires a slightly different configuration to ensure that all locomotives function correctly in the consist. For this purpose, we use the radio to operate the rear locomotives as if they were directly connected.

Using the same example of a pair of locomotives at the front, and a pair at the back, you would configure as follows:

Front Pair:

- Lead Unit:** Set up as Lead and ensure the radio circuit breaker is set to on (SD40-2: G52 / AC4400CW: J54). You will also need to enable the Banking Comms (SD40-2: A3 / AC4400CW: G43)
- Trailing Unit:** Set up as Trail.

Rear Pair:

- Lead Unit:** Set up as per the above. However, on the AC4400CW also ensure that the DPU Circuit Breaker is on (J57). Leave throttle, brake and reverser handles in their default states.
- Trailing Unit:** Set up as Trail.

In this configuration when the engineer makes a throttle or brake change on the front pair lead unit, the front trailing unit will respond because it is physically connected. At the same time, a radio message is sent (inaudible to the player) which the rear pair lead unit will react to and will follow the same settings. This will then be automatically reflected on the rear pair trailing unit through its direct connection. This system is intended to mimic the behaviour of a second engineer in the rear pair leading unit that is following the actions of the lead engineer.

When set up in this way, the engineer at the front of the train has full control over all four locomotives simultaneously. Failing to set up rear-end locomotives for Distributed Power mode will mean that they can only get pulled as "dead weight".

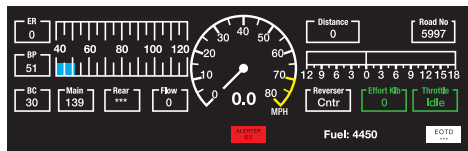
7 LOCOMOTIVE SAFETY SYSTEMS

The Alerter is a simple vigilance device that ensures the engineer or person controlling the train is alert and in full control of the locomotive. It does this by sounding an alarm at regular intervals, usually 60 seconds, that the engineer must respond to within a set amount of time, usually 5 seconds. If the engineer fails to respond, the brakes will automatically apply, bringing the train to a safe and controlled stop.

In the AC4400CW there is no in-cab interactive way to enable or disable the Alerter. By default, it is set to disabled so that players can familiarise themselves with the functions of the locomotive without the constant annoyance that vigilance devices tend to inflict.

To enable or disable the Alerter, you must be seated in the engineer's seat of the cab you intend to operate from (usually the lead locomotive). Press the appropriate key(s) or button(s) which corresponds to the Enable Safety Systems control shown in the settings menu.

Once enabled, you will note an additional indicator is displayed:



The red ALERTER 65 indicator will begin counting down once your locomotive exceeds 5 mph and the amount of time to go till the next alert is always shown so you know when to expect the audible alarm.

When the timer reaches 5, the Alerter will sound and you must acknowledge the alert by pressing the Alerter Reset (E33) button on the control desk or by using the appropriate key(s) or button(s) shown in the settings menu. This must be done before the timer reaches 0.

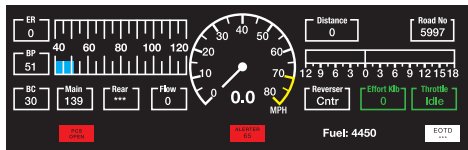
In the SD40-2, the system is much simpler as there is no electronic screen to interface with. It can be enabled in the cab using the Warning Devices Circuit Breaker (G70). Before enabling the system, you must have sat in the engineer's seat at least once before the system will engage. You can use the same keyboard or gamepad controls as for the AC4400CW.

The Alerter in the SD40-2 can be acknowledged using the Alerter Reset button (A9) in the cab or the same keyboard or gamepad controls as used for the AC4400CW.

The Pneumatic Control Switch is a safety feature used on many North American locomotives. It is the system that essentially brings a train consist to a safe and controlled stop in the event of an emergency such as failing to reset the Alerter or the emergency brakes have been tripped in some other way.

AC4400CW PCS RESET PROCEDURE

For the AC4400CW, you can see that the system has activated because of an additional PCS OPEN indicator on the IFD:



Before you do anything, you need to allow the train to come to a complete stop. You will not be able to reset the system whilst the train is still in motion. Continue with these steps to reset the system:

1. Reset the Alerter with the Reset Button (E33).
2. Ensure the Throttle (E30) is set to Idle.
3. Set the Reverser (E29) to Neutral.
4. Set the Independent Brake (E32) to Full Service.
5. Set the Auto Brake (E31) to Emergency.

6. Wait for 60 seconds.
7. Release the Auto Brake, and wait for the Equalizing Reservoir / Brake Pipe on the IFD to return to 90 PSI.
8. Once the Equalizing Reservoir and Brake Pipe has returned to 90 PSI, and the Main Reservoir has recharged to 140 PSI, you can then continue with setting the Reverser, releasing the Auto Brake, then the Independent Brake and can apply Throttle.

Note: The air compressor on the AC4400CW is computer controlled and will activate automatically to maintain the pressure in the Main Reservoir.

SD40-2 PCS RESET PROCEDURE

For the SD40-2, you can see that the system has activated because the PCS OPEN Fault Indicator (C17) will be lit.

As with the AC4400CW, you must allow the train to come to a complete stop before attempting the reset procedure.

1. Reset the Alerter with the Reset Button (A9).
2. Ensure the Throttle (C24) is set to Idle.
3. Set the Reverser (C30) to Neutral.
4. Set the Independent Brake (A6) to Full Service.
5. Set the Auto Brake (A4) to Emergency.
6. Wait for 60 seconds.
7. Release the Auto Brake, and wait for the Equalizing Reservoir (B12) / Brake Pipe (B13) to return to 90 PSI.

8. As the Auto Brake is releasing, move the Throttle lever (C24) to the first notch. This will power the air compressor so that it can recharge the main reservoir.
9. Once the Equalizing Reservoir and Brake Pipe has returned to 90 PSI, and the Main Reservoir has recharged to 140 PSI, you can return the Throttle to Idle.
10. You can now continue with setting the Reverser, releasing the Auto Brake and the Independent Brake, and can apply Throttle.

8 GENERAL INFORMATION

The Dovetail Forums are your one-stop destination for everything Train Simulator and Train Sim World related. We have an ever growing and vibrant community of train enthusiasts from all over the world, ranging from experienced railroad veterans to new players getting into the world of train simulation. So, if you haven't already, why not sign up for an account today and join our community – we'd love to have you on board!

See more at: <https://forums.dovetailgames.com>

Dovetail Live is an online destination which enables players to interact with Dovetail's products and each other in an environment tailored specifically to fans of simulation entertainment. Dovetail Live will evolve to become central to Train Sim World®, enriching the player experience in every way from offering rewards, building a community of likeminded players and helping every player find the right content to create their own perfect personal experience.

Signing up for Dovetail Live is completely voluntary. However, users that do sign up for it will receive exclusive benefits in the future.

See more at: <https://live.dovetailgames.com>

I have a problem downloading the Steam client, how do I contact them?

You can contact Steam Support by opening a customer service ticket at <https://support.steampowered.com>. You will need to create a unique support account to submit a ticket (your Steam account will not work on this page) and this will enable you to track and respond to any tickets you open with Steam.

How do I change the language of Train Sim World?

This is an easy process and will allow you to play Train Sim World in English, French, German, Spanish, Russian and Simplified Chinese. To change the language of Train Sim World, double-click on the Steam icon on your PC desktop, left click on 'Library', right click on 'Train Sim World', left click on 'Properties', and finally left click on the Language tab and select your preferred language.

How do I reset my display screen size settings?

It is possible to change the display screen size settings for Train Sim World from within the game. Changing display screen size settings is done from the Settings menu in the Display tab.

For any questions not covered here, visit our knowledgebase at <https://dovetailgames.kayako.com>



www.skyhookgames.com

